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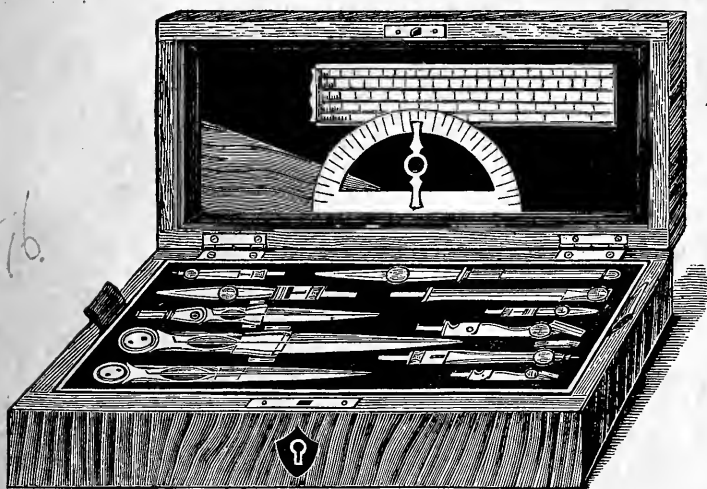
—OF—

Mathematical *** Instruments,

DRAWING PAPER, SURVEYING INSTRUMENTS, LEVELS,

PAINTS AND DRAWING MATERIALS.

ILLUSTRATED.



Manufactured, Imported and Sold Wholesale and Retail by

F. W. McALLISTER,

OPTICIAN,

No. 3 N. CHARLES STREET,

BALTIMORE, MD.

1890.

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Having the largest and most complete stock of Mathematical, Engineering and Surveying Instruments in the United States, we are enabled to furnish all goods mentioned herein, of the best quality, and at the lowest prices.

In ordering from this Catalogue it is only necessary to mention this edition and to give the number of the Instrument or article desired.

The prices mentioned will be strictly adhered to, except when large quantities are ordered.

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When no satisfactory Baltimore, Philadelphia or New York references is given by the party ordering the goods, the money must accompany the order, or if preferred, the goods will be sent by Express, C. O. D. (collect on delivery), *provided the order is accompanied with a remittance of Five Dollars*, and when the order comes from West of the Mississippi, the order must be accompanied by a remittance of Ten Dollars. The object of this is to insure the goods being taken, as we have frequently sent goods by Express which have not been taken out of the office, and have had to pay freight and charges both ways.

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T351
F. W. McALLISTER,

(LATE OF PHILADELPHIA,)

No. 3 N. Charles Street,

BALTIMORE, MD.

JANUARY, 1890.

Blue Print Paper

—: FOR :—

COPYING TRACINGS.

This Blue Process, now extensively used in the Drawing-Rooms of our most prominent Railroads, in Engineers' and Architects' Offices, saves not only much labor and expense, but a great deal of weariness to the junior draftsman, to whose lot it usually falls to make copies or tracings of drawings. The manipulations required are of the simplest possible kind, and are entirely within the skill and comprehension of any office-boy who can be trusted to copy a letter in an ordinary press. These particulars are as follows:

1. Provide a flat board as large as the tracing which is to be copied, or better, a photographic frame specially made for the purpose.
2. Lay on this board two or three thicknesses of common blanket, or its equivalent, to give a slightly yielding backing for the paper.
3. Lay on the blanket the prepared paper with the sensitive side uppermost.
4. Lay on this paper the tracing, smoothing it out as perfectly as possible, so as to insure a perfect contact with the paper.
5. Lay on the tracing a plate of clear glass, which should be heavy enough to press the tracing close down upon the paper. Ordinary plate glass of $\frac{3}{4}$ inch thickness is quite sufficient.
6. Expose the whole to a clear sunlight, by pushing it out on a shelf from an ordinary window, or in any other convenient way. IN BRIGHT SUNLIGHT LIKE MIDSUMMER, ONLY FOUR MINUTES REQUIRED. A GREAT DEAL DEPENDS UPON THE SUN'S BRIGHTNESS AND HEAT. Frequently when complaints are made about prepared paper, OFTEN IT IS NOT THE FAULT OF THE PAPER, BUT NOT EXPOSED LONG ENOUGH to develop it. Experience will teach you a great deal more than I can. If a clear skylight only can be had, the exposure must be continued for thirty to forty-five minutes, and under a cloudy sky, sixty to ninety minutes may be needed.
7. Remove the prepared paper and drench it freely for ten minutes or longer, in clear water, and hang it up by one corner to dry.

The paper should be stored in a dry place, and be entirely shielded from the sunlight before being used.

The paper is of a full yellow or bronze color. After the exposure to the light the surface becomes a darker bronze or yellowish gray, and the lines of the tracing appear as still darker on the surface. Upon washing the paper, the characteristic blue tints appear with the lines of the tracings in vivid contrast.

Such copies can be taken from tracings only, either made on tracing-paper or cloth. A very deep black India Ink should be used, as the distinctness of the copies depends thereon.

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Print Frames made of hard wood. finely finished, with Glass and Cushions complete :

Polished Plate Glass.	Double Thick Glass.	Frames Only.
10x24 \$10 50	\$ 8 00	\$ 6 50
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BLUE PRINT PAPER.

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27 inches wide, medium, in rolls of 50 yards, per yd. 13c.	per roll, \$ 5 50
30 " " " " " " 15c.	" 6 00
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42 " " " " " " 20c.	" 8 50
54 " " " " " " 30c.	" 10 50

VULCAN (Not Prepared) heavy, in rolls of 10 and 50 yards.

27 30 36 42 54 inches wide.	
\$1 35 \$1 50 \$1 85 \$2 25 \$2 65, 10 yd. roll.	
5 50 6 00 6 50 8 50 10 50, 50 "	

AURORA, prepared in Rolls of 10, 25 and 50 Yards.

27 inches wide, 10 yards, \$2 15	25 yards, \$5 00	50 yards, \$10 00
30 " " " 2 30	" 5 75	" 10 50
36 " " " 2 75	" 6 25	" 11 50
42 " " " 3 60	" 7 00	" 13 00

Having ample room in my new store, No. 3 North Charles street, to store and display a complete stock of Mathematical Goods, and having made large additions in that department, I would respectfully call your attention to my stock of Drawing, Mounted, Tracing and Detail Papers, also Tracing Cloths and Mathematical Instruments of all descriptions. I am also now prepared to receive orders for Sensitized Blue Print Paper in sheets of any size, or continuous rolls of 10 yards each, at the following low prices :

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Architects, Engineers, &c., in any part of the country, who have no facilities for making "Blue Prints," can send us their tracings, stating number of copies required, from which we will produce the desired prints and promptly return same to sender. Prices will be sent on application.

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These instruments are celebrated for being more perfectly made than those of any other manufacturer. They are unexcelled for their uniform finish and quality of workmanship, being made of the best steel and German silver.



3001.



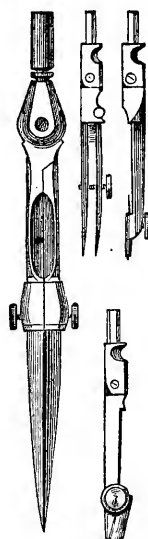
3003.



3004.

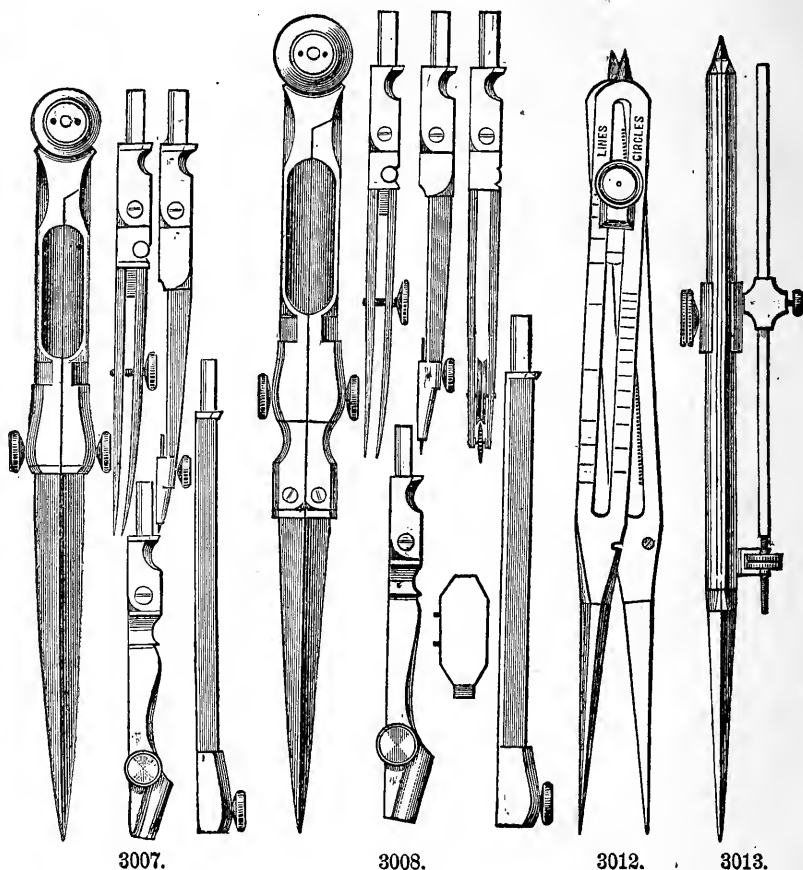


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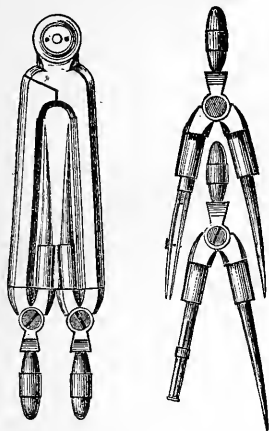


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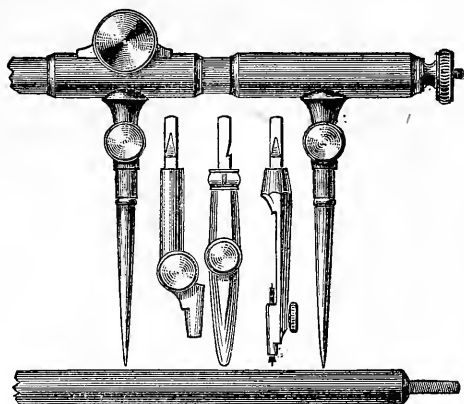
3000.	Plain Dividers, 4 inches long	each	\$1 50
3001	" " 5 " "	"	1 75
3002.	Hairspring Dividers, 4 inches long	"	2 25
3003.	" " 5 " "	"	2 50
3004.	Dividers, 3 inches long, with fixed Needle Point and Pencil	"	3 00
3005.	" 3 " " " " Pen	"	3 00
3006.	" 3 1/2 " with Needle Point, Pen and Pencil	"	5 00



- | | | |
|-------|--|-------------|
| 3007. | Dividers, $5\frac{1}{2}$ inches long, with Pen, Pencil, Needle Point and Lengthening Bar | each \$6 50 |
| 3008. | Dividers, $6\frac{1}{2}$ inches long, with Pen, Pencil, Needle Point, Dotting Pen and Lengthening Bar | " 9 00 |
| 3009. | Pocket Dividers, 5 inches long | " 2 40 |
| 3010. | Bisecting " $7\frac{1}{2}$ " " | " 3 50 |
| 3011. | Triangular Compass, 6 inches long | " 4 25 |
| 3012. | Proportional Dividers, 8 inches long, with Rack Movement, graduated for lines and circles | " 10 50 |
| 3013. | Proportional Dividers, 9 inches long, with Micrometer Adjustment, finely graduated for lines and circles | " 12 00 |

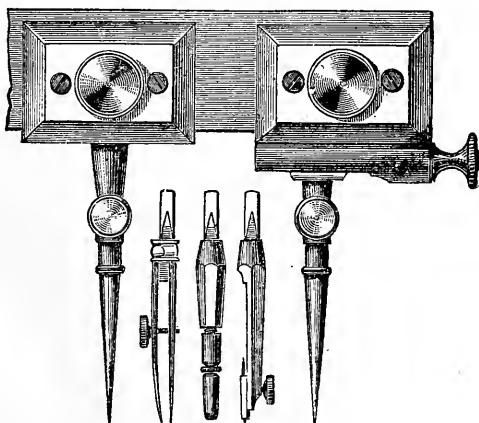


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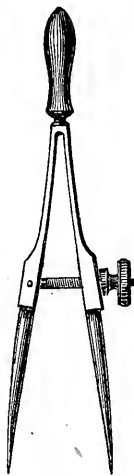
3016.

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|-------|--|-------------|
| 3014. | Pillar or Pocket Dividers, | each \$8 00 |
| 3015. | Pocket Dividers, with turning points | " 6 75 |
| 3016. | Beam Compass, 2 Bars, 20 inches long, with Pen, Pencil,
Needle Point and two Steel Points | " 9 25 |
| 3017. | Beam Compass, 3 Bars, 21 inches long, with Pen, Pencil,
Needle Point and two Steel Points | " 10 50 |
| 3018. | Beam Compass, 4 Bars, 28 inches long, with Pen, Pencil,
Needle Point and two Steel Points | " 12 00 |
| 3019. | Beam Compass, 4 Bars, 36 inches long, with Pen, Pencil,
Needle Point and two Steel Points | " 15 00 |
| 3020. | Beam Compass, 4 Bars, 54 inches long, with Pen, Pencil,
Needle Point and two Steel Points | " 21 00 |

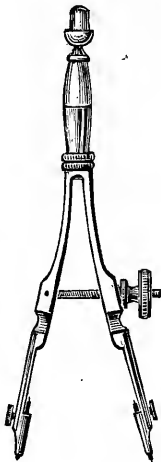


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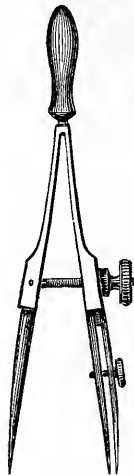
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| 3021. | Furniture for Beam Compass | each \$7 00 |
|-------|--------------------------------------|-------------|



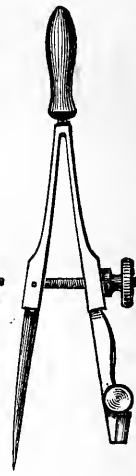
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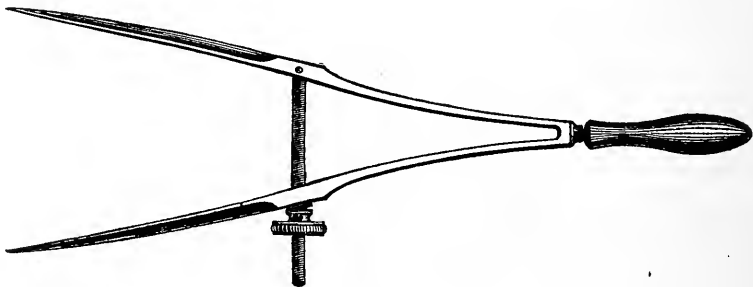
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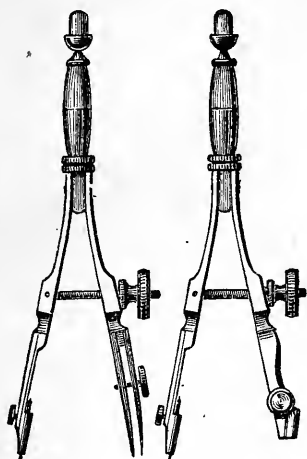


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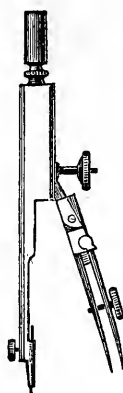
3025.

3022.	Steel Spacing Dividers, Metal Handle, 2½ inches long . . .	each \$1 70
3023.	Steel Spacing Dividers, Ivory Handle, 3 inches long . . .	" 1 50
3024.	" " " " " 3 " with Needle Points . . .	" 2 50
3025.	Steel Spacing Dividers, Ivory Handle, 5 inches long . . .	" 2 50
3026.	Spring Bow Pen, Ivory Handle, 3 inches long . . .	" 2 00
3027.	" " " " " 3 " " with Needle Point . . .	" 2 50
3028.	" " " Metal " 2½ inches long . . .	" 2 25
3029.	" " " Pencil, Ivory " 3 " " . . .	" 2 00
3030.	" " " " " 3 " " with Needle Point . . .	" 2 50
3031.	" " " Metal " 2½ " " . . .	" 2 25

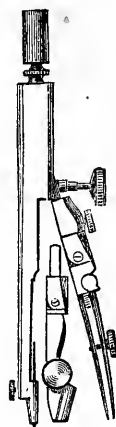


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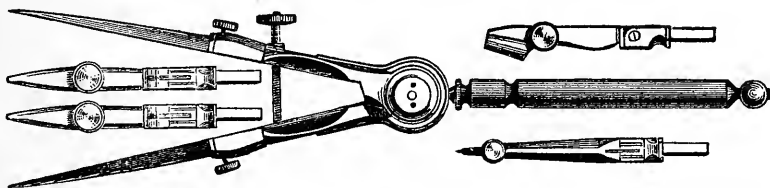


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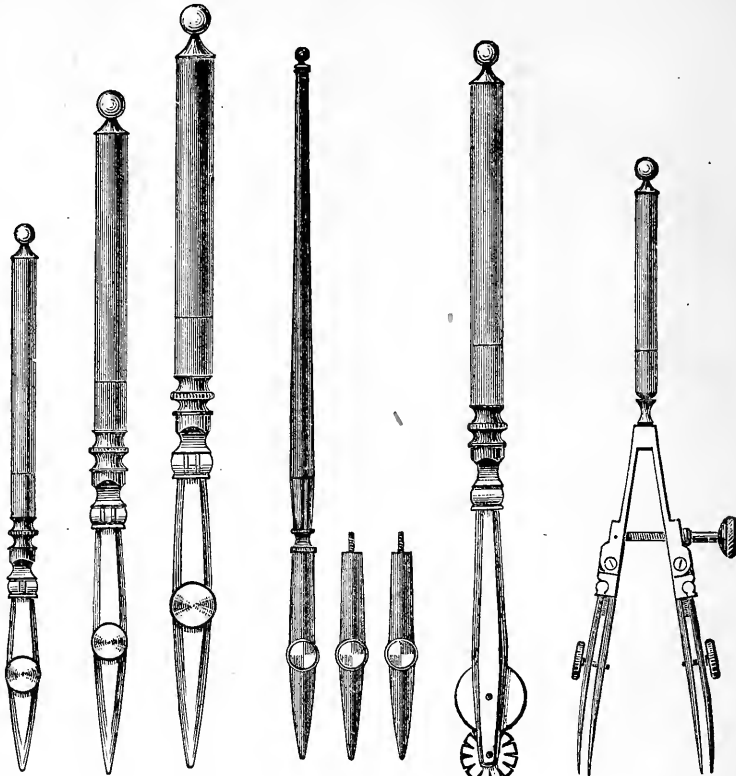
3033.

3032. Spring Bow Pen, German Silver Case each \$2 00
 3033. " " " with Pencil Point, German Silver Case " 3 00



3034.

3034. Dividers, with Spring, 4 inches long, with two Pens, Pencil,
 Needle Point and Ivory Handle each \$7 00
 3035. Drawing Pen, with Hinge and Needle Point, $4\frac{1}{2}$ inches long " 1 25
 3036. " " " " " $5\frac{1}{4}$ " " 1 40
 3037. " " " " " 6 " " 1 60
 3038. Hatching Pen, pushing screw, 3 blades " 2 50
 3039. Roulette or Dotting Pen, $5\frac{1}{2}$ inches long " 2 00
 3040. Roulette, with six wheels " 3 50



3035.

3036.

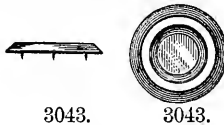
3037.

3038.

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3041.

3041. Railroad Pen, with hinge to pens, $5\frac{1}{2}$ inches long " 3 00
 3042. Railroad Pen, without hinge, $5\frac{1}{2}$ inches long, with double screw
 adjustment " 3 75
 3043. Horn Centre, German Silver Rim " 40



3043.

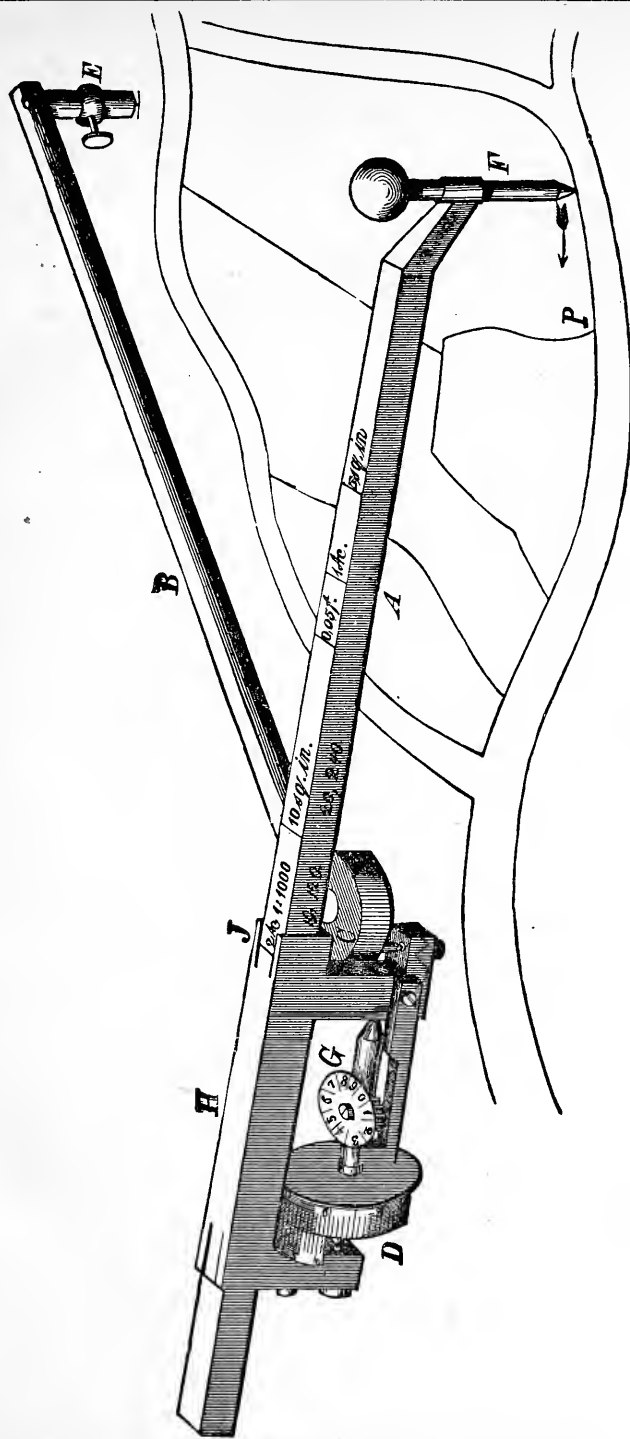
3043.

3044. German Silver Thumb Tacks doz. 60
 3045. Steel Thumb Tacks " 60
 3046. Eccentric Rule, 12 inches long each 2 50



3047.

3047. Rolling Parallel Rule of Ebony, 12 inches long " 3 50
 3048. Amsler's Polar Planimeter 30 00



3048

AMSLER'S POLAR PLANIMETER.

DIRECTIONS FOR USING AMSLER'S POLAR PLANIMETER.

By means of AMSLER'S POLAR PLANIMETER, a person entirely ignorant of geometry may ascertain the area of any planimetric figure, no matter how irregular its outlines may be, more correctly, and in much shorter time, than the most experienced mathematician could calculate it.

The management of the instrument can be easily learned in half an hour, and in size it is no larger than a two-feet folding rule.

The Planimeter indicates square feet, or square inches, and acres for surveying.

DIRECTIONS.—Preparatory to the use of the instrument, ascertain its state. The index roller D must play easily, without coming in contact with the nonius (or vernier). The screw centres, on which its axis revolves, must be adjusted so as to allow perfect freedom of rotation; the same is to be observed for the centre pin C.

The needle point E ought to project but very little from its socket. Great care must be taken not to bend any part of the instrument.

To ascertain the area of a figure in square inches, slide the square rod A into the tube H, so that the line marked 10 sq. in. (10 square inches) stands fair with the beveled part of the tube J. Then set the instrument on the paper, so that the index roller D, the tracing point F, and the needle point E, rest on the paper; press the latter point a little on the paper—not enough to pierce it through. This point is to remain stationery during the whole operation. Set the tracing point F on any point P of the outline, and mark that point, and read off the state of the counting wheel G, and the index roller D. Suppose the counting wheel indicates 3 (as in cut), the index roller 905 (90 degrees to be read on the index roller, and $\frac{5}{10}$ on the nonius), so that the O of the nonius stands on $90\frac{5}{100}$ of the circumference of the index roller. Write down the number just read off thus, 3,905.

Now follow, with the tracing point F, the outline of the figure, or part of the figure to be measured, with great exactness, in the same direction as the hands of a watch would move, until you arrive at the starting point.

Straight lines may be followed along a rule; then read off again the state of the indicators. Suppose you find now 5,763, *i. e.* the counting wheel indicating 5, and the index roller and nonius $76\frac{3}{10}$ degrees. From these two readings, the area found is to be obtained, and here two points are to be considered.

A. If the needle point E is outside of the figure just traced round, the first number (3,905) is to be deducted from the second number (5,763).

	5,763	
	3,905	and the remainder (1,858) is to
be multiplied by ten, equal 18.58;	1,858	
which is the area desired.		

B. If the needle point E is inside of the outlines of the figure, add to the number last read off (5,763) the number marked on the side of the square rod next to where 10 sq. in. is marked on the upper side.

	5,763 read off	
	20,240	
	26,003	
	3,905	Deduct from this
amount the number first read off,	22,098	
		Multiply this remainder by
		ten, equal 220,98, and this is the amount of square inches, or area of the measured figure.

It is of no consequence whether the roller moves inside or outside of the cut-lines of the figure, provided it moves on a smooth surface even with the figure.

To obtain the area in square feet, slide the square rod into the tube up to the line marked 0,1 sq. ft. or 0,05 sq. ft. In this case the difference between the first and second readings of the indicators is to be multiplied by 0,1 or 0,05. If the difference, for instance, is 4,653, the rod being up to the line marked 0,1 sq. ft., then is $4,653 \times 0,1 = 0,4653$ equal to the area in decimal fractions of a square foot.

If the needle point is within the outlines of the figures as described in B, proceed the same way as at B, but multiply by 0,1 or 0,05.

If the figure to be measured is at a reduced scale, the result has to be multiplied by the square of the proportion of the reduction. If the proportion of the figure to the full size is as 1 : 10, the result is to be multiplied by $10^2 = 100$ —for instance : the result of the first example is 1,858, which multiplied by 100 ($1,858 \times 100$) = 1858 sq. inches, would be amount of the area.

If the amount of acres is to be ascertained, the proportion of the reduction being 1 : 1000, slide the square rod up to the line marked 2 ac. 1 : 1000, or 1 ac., and operate as indicated above : the result is to be multiplied by 1 or 2, instead of 10 or 5. If the rod is set up to the line marked 1 ac., no multiplication is necessary.

Should the plan of the piece of land be drawn on a smaller scale than $\frac{1}{1000}$ —for example, $\frac{1}{5000}$ th—then multiply the result with the square of the proportion of the reduction to the scale of $\frac{1}{1000}$. Thus, for the scale of $\frac{1}{5000}$ th, the result would have to be multiplied by $5 \times 5 = 25$ ($\frac{1}{5000}$ ths being to $\frac{1}{1000}$ th as 5 : 1). If the scale is $\frac{1}{5000}$ th, multiply the result by $\frac{1}{2}^2 = \frac{1}{4}$, that is to say, divide the result by 4.

Remark.—If, on reading off the horizontal or counting wheel, G, the indicator points near the middle line between two figures, say between 3 or 4, then see how the index roller stands to the nonius. If the 0 on the nonius is on the lower side of the 0 of the roller, therefore near 100, then read 3 ; but if the 0 on the nonius is on the upper side, therefore near 0 on the roller, then read 4 for unity.

If the horizontal wheel turns on its axis during the tracing operation, so that it goes beyond 0 (in fact 10), and even marks several revolutions, and then stops at any number—for instance, 7—you read 17 or 27, &c., adding as many times ten as the wheel has made full revolutions.

It is easy to notice the number of revolutions. If the wheel G marks six, and the roller D is, for instance, on 0 degrees $\frac{7}{10}$ degrees, or on 4 degrees $\frac{7}{10}$ degrees, then the reading is of course 6,007, or 6,047. The number read off the nonius always taking the third place after the units.

The cut shows the actual size of the instrument.

Price in Box \$30 00

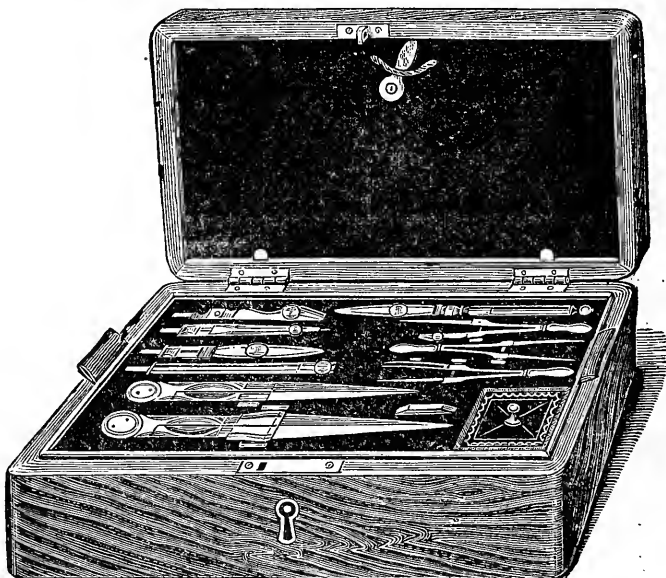
Draftsmen, engineers, surveyors, ship builders, architects, machinists, will please devote a few moments only to the examination of this instrument, and they will at once be convinced of its great importance and value.

Cases of Kern's Swiss Instruments.



3050.

3050. Morocco Case, containing: Dividers $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Plain Dividers 5 inches long; Drawing Pen $5\frac{1}{4}$ inches long. each \$11 50
3051. Morocco Case, containing: Dividers $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Dividers $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Hairspring Dividers 4 inches long; Protractor $\frac{1}{2}$ circle, $5\frac{1}{2}$ inches diameter; 2 Drawing Pens $4\frac{1}{2}$ and $5\frac{1}{4}$ inches long. " 22 00



3052.

3052. Polished Walnut Case 9 x 6, with Lock and Key and Tray, containing: Dividers $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Hairspring Dividers, 4 inches

long; Steel Spacing Dividers, Ivory Handle; Spring Bow Pen Ivory Handle; Spring Bow Pencil, Ivory Handle; Protractor $5\frac{1}{2}$ inches diameter $\frac{1}{2}$ circle; Drawing Pen $5\frac{1}{4}$ inches long; Triangular Scale 6 inches long. each \$24 00

3053. Polished Walnut Case, $10\frac{1}{2}$ inches long and $6\frac{1}{2}$ inches wide, Lock and Key and Tray, containing: Dividers $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Dividers $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Hairspring Dividers 4 inches long; Spring Bow Pen, Ivory Handle and Needle Point; Spring Bow Pencil, Ivory Handle and Needle Point; Furniture for Beam Compass; Protractor $\frac{1}{2}$ circle $5\frac{1}{2}$ inches diameter; Drawing Pen $5\frac{1}{4}$ inches long. " 35 00

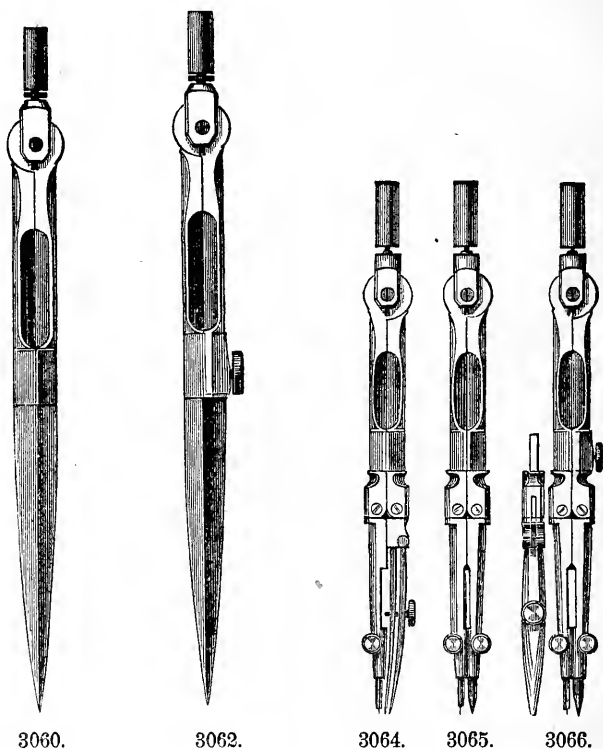
3054. Polished Walnut Case, 14 inches long and $6\frac{1}{2}$ inches wide, Lock and Key and Tray, containing: Dividers $6\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil, Dotting Pen and Lengthening Bar; Dividers $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers 5 inches long; Hairspring Dividers 5 inches long; Proportional Dividers, with rack movement 8 inches long; Steel Spacing Dividers, Ivory Handle; Spring Bow Pen, Ivory Handle; Spring Bow Pencil, Ivory Handle; Beam Compass 4 Bars, 28 inches long, with 2 Steel Points, Pen, Pencil and Needle Point; Railroad Pen, with hinge to pens; 2 Drawing Pens $4\frac{1}{2}$ and $5\frac{1}{4}$ inches long; Triangular Scale 12 inches long; German Silver Protractor, with Arm and Vernier, 5 inches diameter. " 72 00

3055. Polished Rosewood Case, 14 inches long, 8 inches wide, and 3 inches deep, Silk Velvet Lining, Lock and Key and Tray, containing: Dividers $6\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil, Dotting Pen and Lengthening Bar; Dividers $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers 5 inches long; Hairspring Dividers 5 inches long; Dividers with Spring 4 inches long, with two Pens, Pencil, Needle Point and Ivory Handle; Proportional Dividers 9 inches long, with Micrometer Adjustment graduated for lines and polygons; Steel Spacing Dividers, Ivory Handle; Spring Bow Pen, Ivory Handle and Needle Point; Spring Bow Pencil, Ivory Handle and Needle Point; Railroad Pen, with hinge to Pens; Roulette; 3 Drawing Pens $4\frac{1}{2}$, $5\frac{1}{4}$ and 6 inches long; Drawing Pen of German Silver for Red Ink; Beam Compass 4 Bars, 28 inches long, with 2 Steel Points, Pen, Pencil and Needle Point; German Silver Protractor $\frac{1}{2}$ circle 8 inches diameter, with Arm and Vernier; Parallel Rule Rolling 12 inches long; Eccentric Rule 12 inches long; 2 Triangular Scales 12 inches long; Ink Slab; Cake of Best Quality India Ink; 12 Cakes or Pens Winsor and Newton's Carmine, Chinese White, French Blue, Scarlet Lake, Gamboge, Burnt Sienna, Burnt Umber, Prussian Blue, Indian Red, Emerald Green, Neutral Tint, Rose Madder. " 120 00

Patent Joint Instruments of German Manufacture.

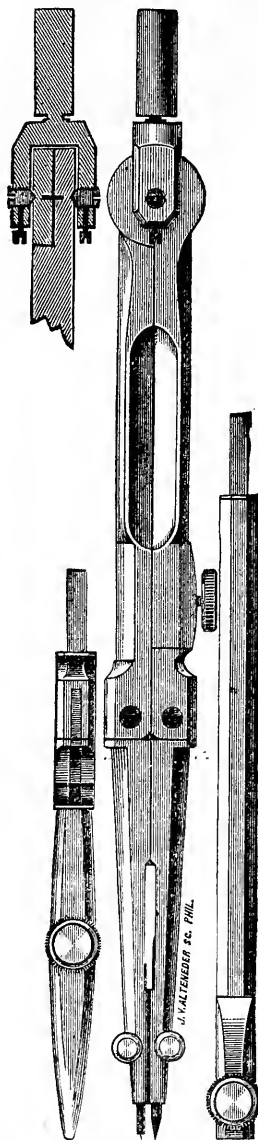
These Instruments are made with a washer between the halves of the joints, which gives uniform motion and also makes them much more durable.

These are finely finished and well made.



3060.	Plain Dividers, 3 inches long.	each \$2 00
3061.	Plain Dividers, 5 inches long.	" 2 75
3062.	Hairspring Dividers, 3 inches long.	" 3 00
3063.	Hairspring Dividers, 5 inches long.	" 3 50
3064.	Dividers, 3½ inches long, with fixed Needle Point and Pen	" 4 75
3065.	" " " " Pencil	" 4 25

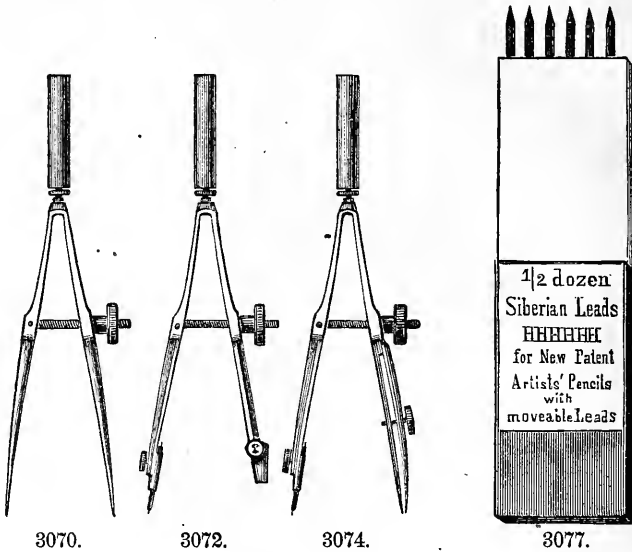
3066. Dividers, $3\frac{1}{2}$ inches long, with fixed Needle Point and Pen and Pencil. each \$6 00
3067. Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil. " 7 00



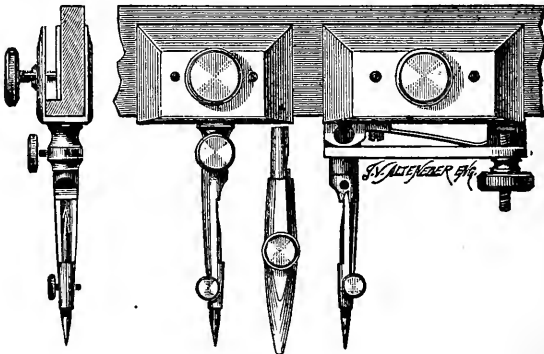
3068.

3068. Dividers, $5\frac{1}{2}$ inches long, with fixed Needle Point, Pen, Pencil and Lengthening Bar. each \$7 50

3069. Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar. each \$8 50



3070. Spring Spacing Dividers, Metal Handle, 3 inches long . . . each \$1 75
 3071. " Bow Pencil, 3 inches long " 2 00
 3072. " " with Needle Point, 3 inches long " 2 75
 3073. " Bow Pen, 3 inches long " 2 00
 3074. " " with Needle Point, 3 inches long " 2 75



3075.

3075. Furniture for Beam Compass, with Improved Micrometer Adjustment; Pen, Pencil and 2 Steel Points . . . each \$8 50
 3076. Hardwood Bar, 36 inches long " 50
 3077. Faber's Leads, 3 H., 4 H. and 6 H., per box " 75



3078.



3079.



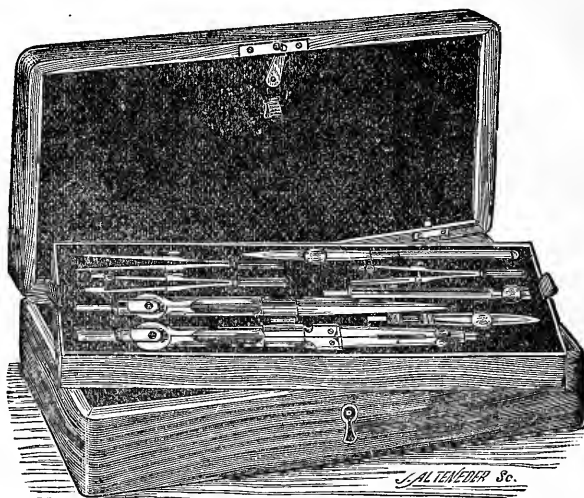
3080.

3078.	Drawing Pen, $4\frac{1}{2}$ inches long, Ebony Handle	.	.	.	each \$1 50
3079.	" $5\frac{1}{4}$ "	"	.	.	" 1 70
3080.	" 6 "	"	"	.	" 1 90

ALTENEDER'S
PATENT INSTRUMENTS
furnished to order.

Cases of Patent Joint Instruments.

3085. Morocco Case, containing: Dividers $5\frac{1}{2}$ inches long, with fixed Needle Point, Pen, Pencil and Lengthening Bar; Hair-spring Dividers, 5 inches long; Spring Spacing Dividers, 3 inches long; Spring Bow Pencil, with Needle Point, 3 inches long; Spring Bow Pen, with Needle Point, 3 inches long; and 2 Drawing Pens, $4\frac{1}{2}$ and $5\frac{1}{4}$ inches long. . . . each \$23 00



3086.

3086. Walnut Case, Lock and Key and Tray, containing: Dividers $5\frac{1}{2}$ inches long, with fixed Needle Point, Pen, Pencil and Lengthening Bar; Hairspring Dividers, 5 inches long; Spring Spacing Dividers, 3 inches long; Spring Bow Pencil, with Needle Point, 3 inches long; Spring Bow Pen, with Needle Point, 3 inches long; and 2 Drawing Pens, $4\frac{1}{2}$ and $5\frac{1}{4}$ inches long each \$25 00
3087. Walnut Case, Lock and Key and Tray, containing: Dividers $5\frac{1}{2}$ inches long with fixed Needle Point, Pen, Pencil and Lengthening Bar; Hairspring Dividers, 5 inches long; Spring Spacing Dividers, 3 inches long; Spring Bow Pencil, with Needle Point, 3 inches long; Spring Bow Pen, with Needle Point, 3 inches long; Furniture for Beam Compass; and 2 Drawing Pens, $4\frac{1}{2}$ and $5\frac{1}{4}$ inches long “ 34 00

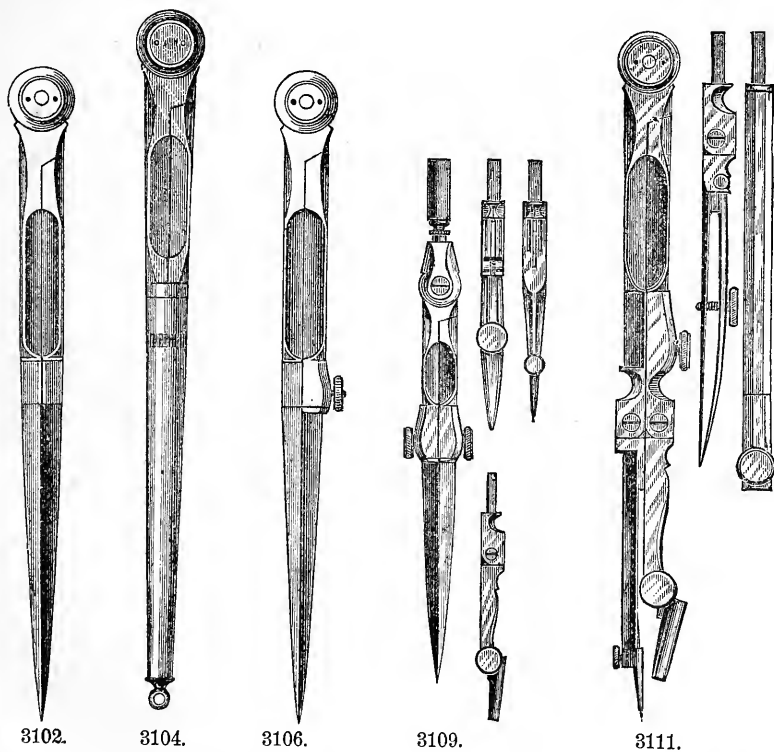
Cases made to order for such Instruments as may be selected.

German Instruments.

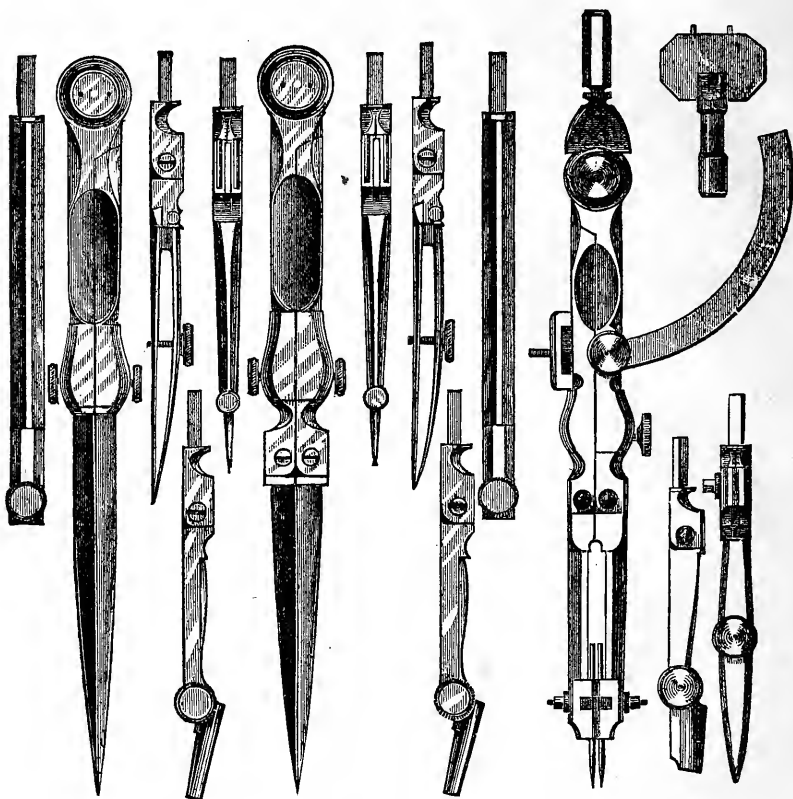
FIRST QUALITY FINELY FINISHED OF STEEL AND GERMAN
SILVER.

THE PENCIL POINTS ARE MADE TO FIT FABER LEADS.

3100.	Plain Dividers, with handle, 3 inches long	each \$	75
3101.	" 4 inches long.	"	70



3102.	Plain Dividers, 5 inches long	each \$	80
3103.	" 6 "	"	1 00
3104.	Pocket Dividers, in sheath, 5 inches long	"	1 50
3105.	Hairspring Dividers, 4 inches long	"	1 25
3106.	" 5 "	"	1 80
3107.	" 6 "	"	2 50
3108.	Triangular, or 3 leg Dividers, 5 inches long	"	3 50
3109.	Dividers, 3½ inches long, with Needle Point, Pen and Pencil	"	2 50



3112.

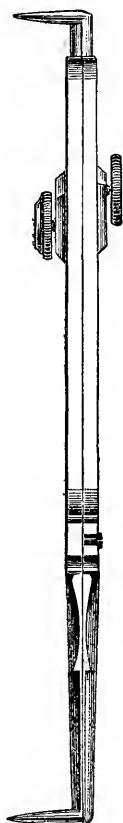
3113.

3114.

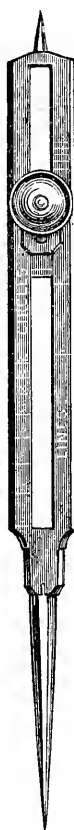
- | | | |
|-------|--|-------------|
| 3110. | Dividers, $3\frac{1}{2}$ inches long, with two Pens, Pencil, Needle Point and Ivory Handle, with Spring | each \$5 00 |
| 3111. | Dividers, $5\frac{1}{2}$ inches long, with fixed Needle Point, Pen, Pencil and Lengthening Bar | " 2 75 |
| 3112. | Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar | " 3 00 |
| 3113. | Dividers, $5\frac{1}{2}$ inches long, with joints in each leg, Needle Point, Pen, Pencil and Lengthening Bar | " 4 00 |
| 3114. | Dividers, 8 inches long, with 2 Steel Points, Pen and Pencil: Micrometer Adjustment, with set screw | " 12 00 |
| 3115. | Dividers, 8 inches long, with 2 Steel Points, Pen, Pencil and Lengthening Bar: Micrometer Adjustment, with set screw | " 12 50 |
| 3116. | Bisecting Dividers, $6\frac{3}{4}$ inches long | " 2 25 |



3117.



3119.

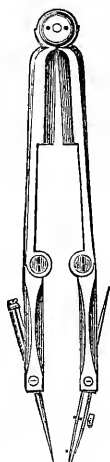


3120.

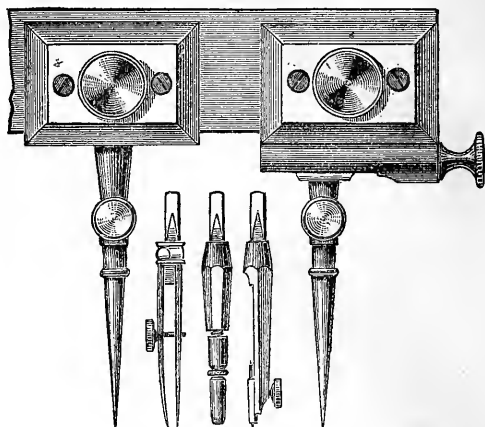


3121.

- | | | |
|-------|--|-------------|
| 3117. | Proportional Dividers, $6\frac{1}{2}$ inches long, graduated for lines, in case | each \$2 25 |
| 3118. | Proportional Dividers, 8 inches long, with Rack Movement, graduated for lines | " 5 00 |
| 3119. | Proportional Dividers, 8 inches long, with Rack Movement, and Bent Points, graduated for lines and circles | " 7 00 |
| 3120. | Proportional Dividers, $6\frac{1}{2}$ inches long, graduated for lines and circles | " 7 50 |
| 3121. | Proportional Dividers, $7\frac{1}{2}$ inches long, graduated for lines and circles, with Rack Movement | " 9 00 |

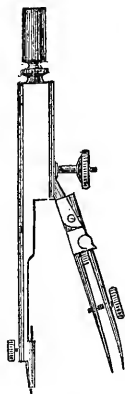


3122.

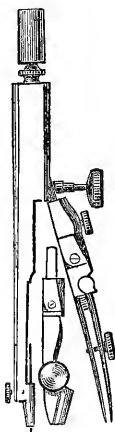


3123.

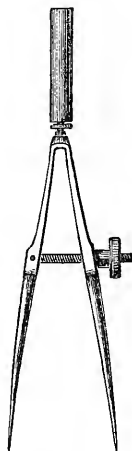
3122. Pocket Dividers, folding Points each \$5 50
 3123. Furniture for Beam Compass in Morocco Case " 6 50



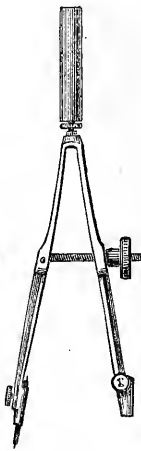
3124.



3125.



3126.

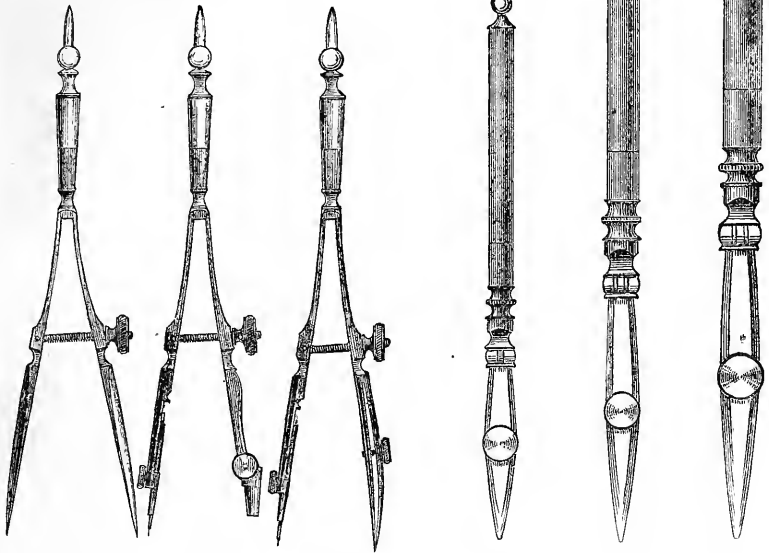


3127.



3128.

3124. German Silver Bow Pen, Needle Point, each \$1 75
 3125. " " and Pencil, Needle Point " 2 25
 3126. Spring Dividers, Metal Handle, 3 inches long " 1 25
 3127. " Bow Pencil, Metal Handle, 3 inches long and Needle
 Point " 1 75
 3128. Spring Bow Pen, Metal Handle, 3 inches long and Needle
 Point " 1 75



3129.

3130.

3131.

3135.

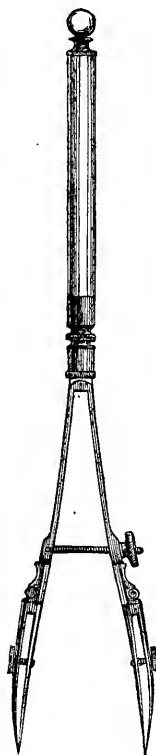
3136.

3137.

3129.	Spring Dividers, Ivory Handle, 3 inches long	each	\$1 25
3130.	" Bow Pencil, Ivory Handle, 3 inches long and Needle Point	"	1 75
3131.	Spring Bow Pen, Ivory Handle, 3 inches long and Needle Point	"	1 75
3132.	Drawing Pen, with Hinge, Ivory Handle, small	"	50
3133.	" " " large	"	60
3134.	German Silver Drawing Pen, Ivory Handle	"	75
3135.	Drawing Pen, with Hinge and Needle, small	"	75
3136.	" " " medium	"	75
3137.	" " " large	"	80



3138.



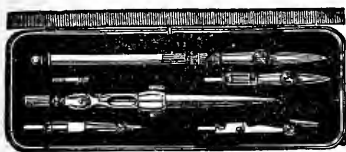
3139.



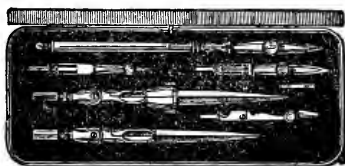
3141.

3138.	Hatching Pen, 2 extra pens	each \$1 75
3139.	Railroad Pen	" 2 25
3140.	Roulette or Dotting Pen	" 90
3141.	Dotting Pen, with 6 wheels, in case	" 3 25
3142.	Border Pen for the heavy lines	" 2 50
3143.	Horn Centres, without rim	" 15

Fine German Instruments in Cases.

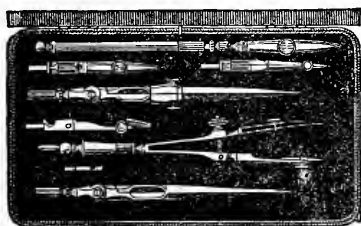


3150.

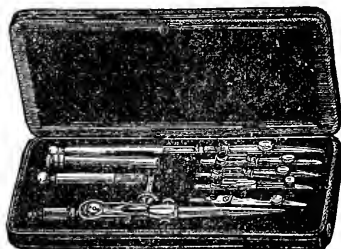


3151.

3150. Morocco Case, containing: Dividers $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil, and one Drawing Pen . . . each \$4 00
3151. Morocco Case, containing: Dividers, $3\frac{1}{2}$ inches long, with Pen, Pencil, Needle Point and Lengthening Bar; and one Drawing Pen . . . " 4 50
3152. Morocco Case, containing: Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers, 3 inches long, and Drawing Pen . . . " 4 75

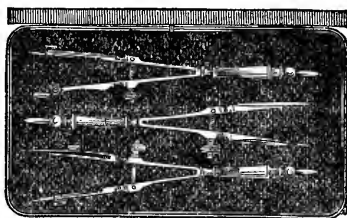


3153.



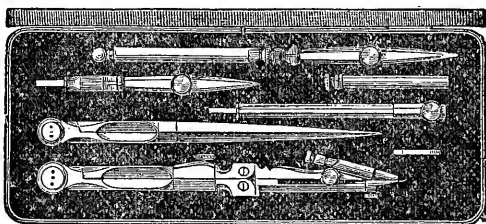
3154.

3153. Morocco Case, containing: Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers, 3 inches long; Bow Pen, with Needle Point and Ivory Handle; and Drawing Pen . . . each \$6 00
3154. Morocco Case, containing: Dividers, $3\frac{1}{2}$ inches long, with Spring and Ivory Handle, two Pens, Pencil and Needle Point and Drawing Pen . . . " 6 00



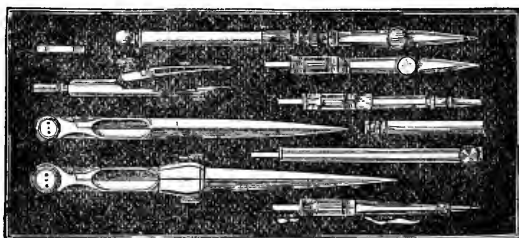
3155.

3155. Morocco Case, containing: Spring Dividers, Ivory Handle; Spring Bow Pen, with Needle Point and Ivory Handle, 3 inches long; Spring Bow Pencil, with Needle Point and Ivory Handle, 3 inches long each \$5 00
3156. Morocco Case, containing: Dividers, $5\frac{1}{2}$ inches long, with Pen and Pencil; Drawing Pen " 3 00
3157. Morocco Case, containing: Dividers, $5\frac{1}{2}$ inches long, with Pen, Pencil and Lengthening Bar; Plain Dividers, 5 inches long; Drawing Pen " 4 00



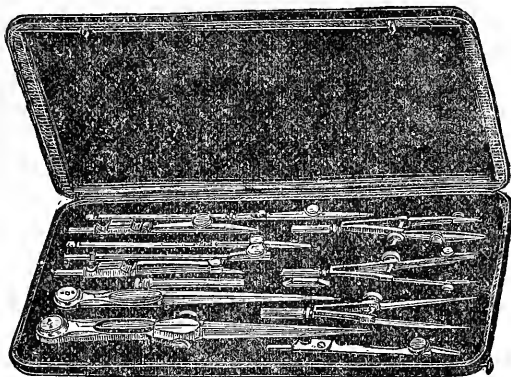
3158.

3158. Morocco Case, containing: Dividers, $5\frac{1}{2}$ inches long, with fixed Needle Point, Pen, Pencil and Lengthening Bar; Plain Dividers, 5 inches long; and Drawing Pen each \$5 00
3159. Morocco Case, containing: Dividers, $5\frac{1}{2}$ inches long, with fixed Needle Point, Pen, Pencil and Lengthening Bar; Plain Dividers, 5 inches long; Bow Pen, with Needle Point and Ivory Handle; Drawing Pen " 6 50
3160. Morocco Case, containing: Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Plain Dividers, 5 inches long; and Drawing Pen " 6 00



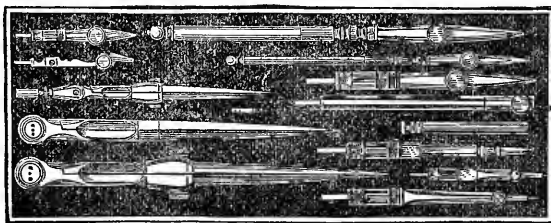
3161.

3161. Morocco Case, containing : Dividers $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar ; Plain Dividers 5 inches long ; Spring Bow Pen, with Needle Point, Metal Handle ; and Drawing Pen each \$7 50



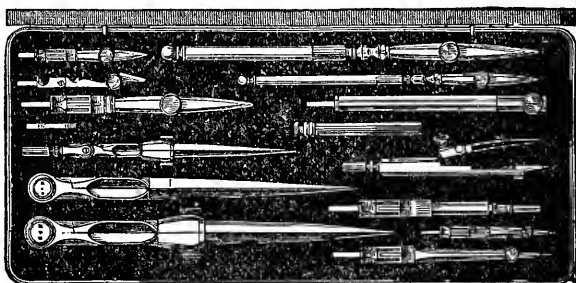
3162.

3162. Morocco Case, containing : Dividers $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar ; Plain Dividers 5 inches long ; Spring Dividers 3 inches long ; Spring Bow Pencil, with Needle Point, 3 inches long ; Spring Bow Pen, with Needle Point, 3 inches long ; and 2 Drawing Pens each \$11 00



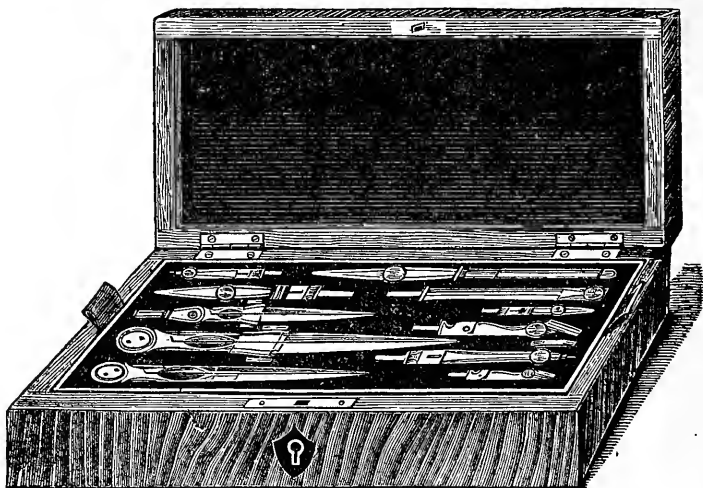
3163.

3163. Morocco Case, containing : Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar ; Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil ; Plain Dividers, 5 inches long ; and 2 Drawing Pens each \$10 00
3164. Morocco Case, containing : Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar ; Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil ; Plain Dividers, 5 inches long ; Spring Dividers, 3 inches long ; Spring Bow Pencil, with Needle Point, 3 inches long ; Spring Bow Pen, with Needle Point, 3 inches long ; and 2 Drawing Pens " 15 00



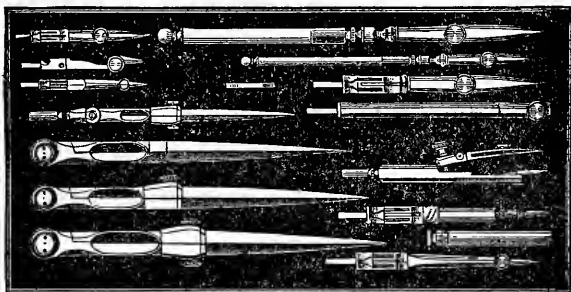
3165.

3165. Morocco Case, containing: Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers, 5 inches long; German Silver Bow Pen, with Needle Point and 2 Drawing Pens each \$11 50



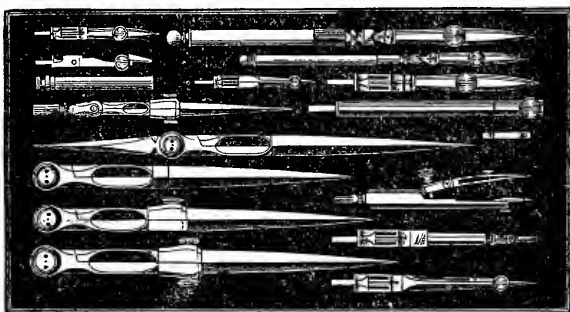
3166.

3166. Polished Walnut Case, Lock, Key and Tray, containing: Dividers $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Dividers $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers, 5 inches long; and 2 Drawing Pens each \$12 00
3167. Polished Walnut Case, Lock, Key and Tray, containing: Dividers $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil, and Lengthening Bar; Dividers $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers 5 inches long; German Silver Bow Pen, with Needle Point and 2 Drawing Pens " 14 00



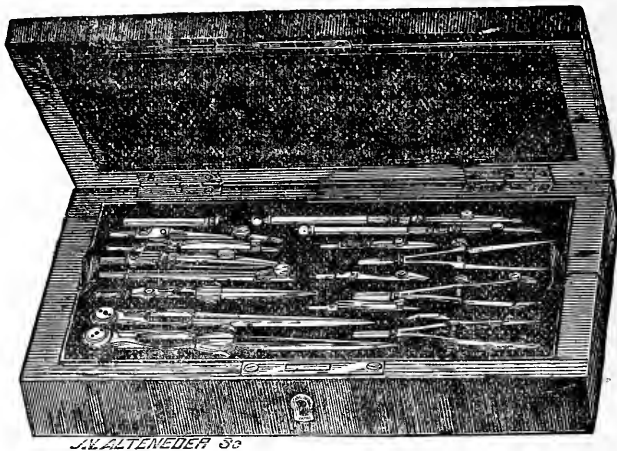
3168.

3168. Polished Walnut Case, with Lock, Key and Tray, containing:
 Dividers $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Dividers $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers 5 inches long; Hair-spring Dividers, 5 inches long; German Silver Bow Pen, with Needle Point; 2 Drawing Pens each \$16 00



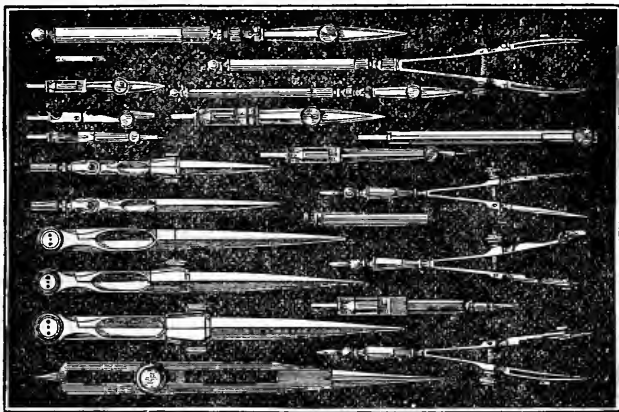
3169.

3169. Polished Walnut Case, with Lock, Key and Tray, containing:
 Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers, 5 inches long; Hair-spring Dividers, 5 inches long; Bisecting Dividers, $6\frac{1}{2}$ inches long; German Silver Bow Pen, with Needle Point; 2 Drawing Pens each \$18 00



3170.

3170. Polished Walnut Case, with Lock, Key and Tray, containing:
 Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers, 5 inches long; Spring Dividers, 3 inches long; Spring Bow Pencil, with Needle Point, 3 inches long; Spring Bow Pen, with Needle Point, 3 inches long; 3 Drawing Pens each \$16 00
3171. Polished Walnut Case, Lock, Key and Tray, containing: Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers, 5 inches long; Hair-spring Dividers, 5 inches long; Spring Dividers, 3 inches long; Spring Bow Pencil, with Needle Point, 3 inches long; Spring Bow Pen, with Needle Point, 3 inches long; and 2 Drawing Pens " 18 00
3172. Polished Walnut Case, Lock, Key and Tray, containing: Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers, 5 inches long; Furniture for Beam Compass; Spring Dividers, 3 inches long; Spring Bow Pencil, with Needle Point, 3 inches long; Spring Bow Pen, with Needle Point, 3 inches long; 3 Drawing Pens " 24 00



3173.

3173. Polished Walnut Case, Lock, Key and Tray, containing: Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers, 5 inches long; Hair-spring Dividers, 5 inches long; Plain Dividers, 3 inches long, with Handle; Proportional Dividers, graduated for lines and circles, $6\frac{1}{2}$ inches long; Spring Dividers, with Ivory Handle, 3 inches long; Spring Bow Pencil, with Ivory Handle and Needle Point, 3 inches long; Spring Bow Pen, with Ivory Handle and Needle Point, 3 inches long; Railroad Pen and 2 Drawing Pens each \$30 00

Cases of German Instruments.

SECOND QUALITY.

3180. Morocco Case, containing: Dividers, $5\frac{1}{2}$ inches long, with Pen, and Pencil; Drawing Pen each \$2 00
3181. Morocco Case, containing: Dividers, 5 inches long, fixed Needle Point, Pen, Pencil and Lengthening Bar; Plain Dividers, 5 inches long; Drawing Pen " 2 50
3182. Morocco Case, containing: Dividers $5\frac{1}{2}$ inches long, with Pen, Pencil and Lengthening Bar; Plain Dividers, 5 inches long; Drawing Pen " 3 00
3183. Morocco Case, containing: Dividers, 5 inches long, with Pen, Pencil and Lengthening Bar; Plain Dividers, 5 inches long; German Silver Bow Pen, with Needle Point; and Drawing Pen " 3 25
3184. Morocco Case, containing: Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Plain Dividers, 5 inches long; Drawing Pen " 5 00
3185. Morocco Case, containing: Dividers, $5\frac{1}{2}$ inches long, with fixed

- Needle Point, Pen, Pencil and Lengthening Bar; Plain Dividers, 5 inches long; Bow Pen, with Needle Point, 3 inches long; and Drawing Pen each \$6 00
3186. Morocco Case, containing: Dividers, $5\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Lengthening Bar; Dividers, $3\frac{1}{2}$ inches long, with Needle Point, Pen and Pencil; Plain Dividers, 5 inches long; and 2 Drawing Pens " 6 50
3187. Rosewood Case, with Lock, Key and Tray, with space below for colors, etc., containing: Dividers, 6 inches long, with fixed Needle Point, Pen, Pencil and Lengthening Bar; Plain Dividers, 4 inches long; Dividers, $3\frac{1}{2}$ inches long, fixed Needle Point, Pen and Pencil; Drawing Pen; Horn and Brass Protractor and Scale " 6 75



3188.

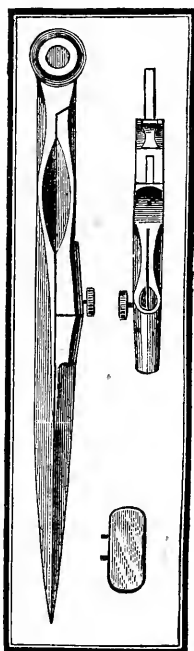
3188. Rosewood Box, with Tray, containing: 6 inch Dividers, fixed Needle Point, Pen, Pencil and Lengthening Bar; $3\frac{1}{2}$ inch Dividers, fixed Needle Point, Pen and Pencil; Plain Dividers, 5 inch; Spring Bow Pen, Needle Point; Drawing Pen; Brass and Horn Protractor and Scale each \$7 50
3189. Rosewood Box, with Tray, containing: 6 inch Dividers, fixed Needle Point, Pen, Pencil and Lengthening Bar; $3\frac{1}{2}$ inch Dividers, with Needle Point, Pen and Pencil; Spring Bow Pen, with Needle Point; Proportional Dividers, $6\frac{1}{2}$ inches long; Horn and German Silver Protractors; and 2 Drawing Pens " 10 75

Brass Instruments for Schools.

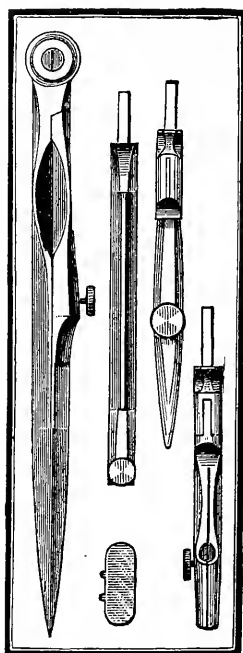
3200.	Plain Dividers, Rivet Joint, 4 inches long	each \$0	20
3201.	" " " " 5 "	"	25
3202.	" " " " 6 "	"	30
3203.	" " Screw " 4 "	"	25



3204.

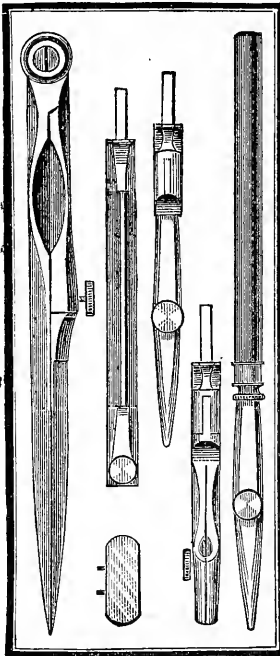


3206.

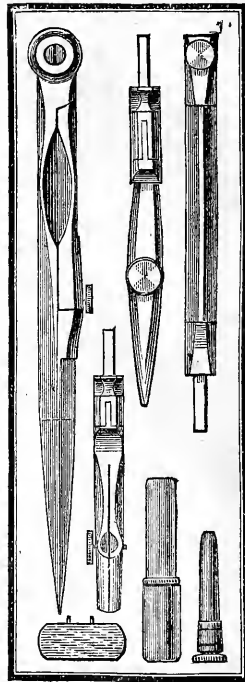


3209.

3204.	Plain Dividers, Screw Joint, 5 inches long	each \$0	30
3205.	" " " " 6 "	"	35
3206.	Dividers, Screw Joint, $4\frac{1}{2}$ inches long, with Pencil	"	40
3207.	" " " $5\frac{1}{4}$ "	"	50
3208.	" " " 6 "	"	60
3209.	" " " $4\frac{1}{2}$ " Pen, Pencil and Bar	"	50
3210.	" " " $5\frac{1}{4}$ "	"	60
3211.	" " " 6 "	"	75

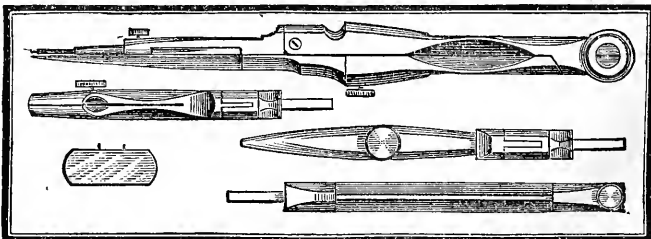


3212.



3214.

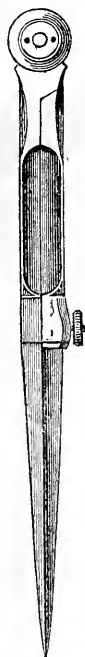
- | | | |
|-------|--|-------------|
| 3212. | Dividers, Screw Joint, $4\frac{1}{2}$ inches long, with Pen, Pencil, Bar and Drawing Pen | each \$0 65 |
| 3213. | Dividers, Screw Joint, $5\frac{1}{4}$ inches long, with Pen, Pencil, Bar and Drawing Pen | " 75 |
| 3214. | Dividers, Screw Joint, $4\frac{1}{2}$ inches long, with Pen, Pencil, Bar and Patent Pencil Point | " 1 00 |
| 3215. | Dividers, Screw Joint, $5\frac{1}{4}$ inches long, with Pen, Pencil, Bar and Patent Pencil Point | " 1 10 |
| 3216. | Dividers, Screw Joint, 6 inches long, with Pen, Pencil, Bar and Patent Pencil Point | " 1 25 |



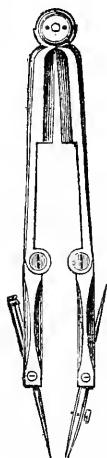
3217.

- | | | |
|-------|---|-------------|
| 3217. | Dividers, Screw Joint, $4\frac{1}{2}$ inches long, with Needle Point, Pen, Pencil and Bar | each \$0 75 |
|-------|---|-------------|

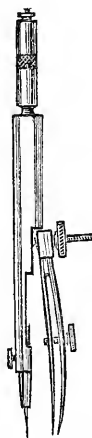
3218. Dividers, Screw Joint, $5\frac{1}{4}$ inches long, with Needle Point, Pen,
Pencil and Bar each \$0 90
3219. Dividers, Screw Joint, 6 inches long, with Needle Point, Pen,
Pencil and Bar " 1 00
3220. Bisecting Dividers " 60



3221.



3222.

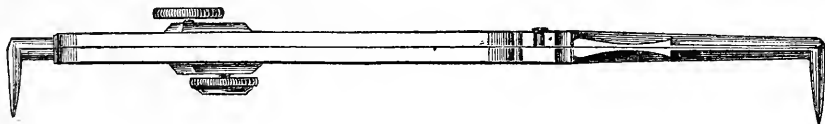


3225.



3227.

3221. Hairspring Dividers, 5 inches long each \$0 80
3222. Pocket Dividers, Folding Points " 3 50
3223. Proportional Dividers, for lines, $6\frac{1}{2}$ inches long in case " 2 00



3224.

3224. Proportional Dividers, for lines, 8 inches long, with Rack move-
ment and Bent Points each \$4 00
3225. Bow Pen, Needle Point " 70
3226. " Pencil, Needle Point, no Spring " 60
3227. Drawing Pen, Ebony Handle " 20
3228. Furniture for Beam Compass " 5 00

3230.	Wood Dividers for Blackboard use, 12 inches long	each \$1 00
3231.	“ “ “ 18 “	“ 1 40
3232.	“ “ “ 24 “	“ 1 75

THE BLACKBOARD SET.

3233. These are the most useful instruments for schools yet designed.
It consists of a Triangle, T Square, Rule and Protractor, all graduated per set \$5 00

Cases of Brass Instruments.

FOR SCHOOLS.

3250. Wood Box, containing : $4\frac{1}{2}$ inch Dividers, with Pen and Pencil ;
Crayon Holder each \$0 60
3251. Wood Box, containing : $4\frac{1}{2}$ inch Dividers, with Pen, Pencil and
Lengthening Bar ; Drawing Pen, Ebony Handle ; Crayon
Holder ; Horn Protractor and Wood Rule “ 90



3252.

3252. Rosewood Case, containing : $4\frac{1}{2}$ inch Dividers, with Pen, Pencil
and Bar ; 4 inch Plain Dividers ; Drawing Pen, Ebony
Handle ; Crayon Holder ; Rule and Brass Protractor each \$1 00
3253. Rosewood Case, containing : 6 inch Dividers, with Pen, Pencil
and Bar ; 5 inch Plain Dividers ; Drawing Pen ; Crayon
Holder ; Wood Rule and Brass Protractor “ 1 30



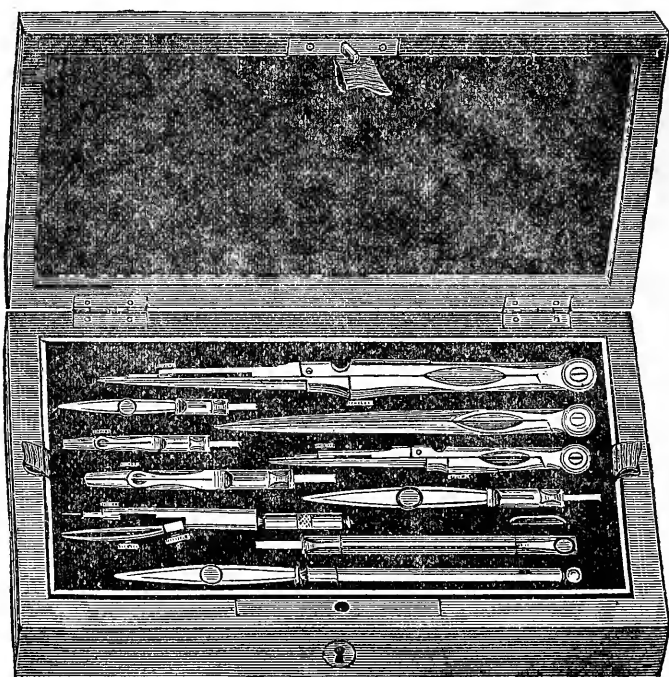
3253.

3254. Rosewood Case, containing : $4\frac{1}{2}$ inch Dividers, with Pen, Pencil and Bar ; 4 inch Plain Dividers ; $3\frac{1}{2}$ inch Dividers, with Pen and Pencil ; Drawing Pen, Ebony Handle, and Wood Rule, Brass Protractor each \$2 00



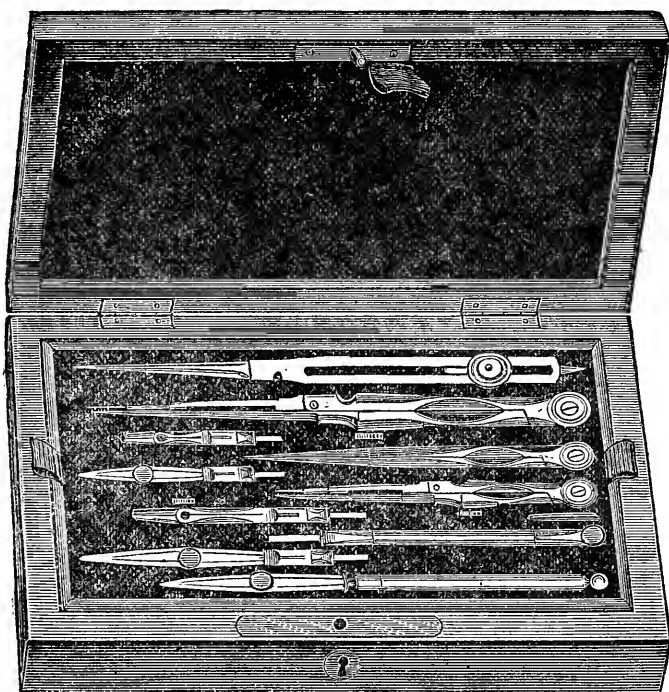
3255.

3255. Rosewood Case, with Tray and Lock; Space for Colors, Brushes, etc., below, containing: $5\frac{1}{2}$ inch Dividers, with Pen, Pencil and Bar; 3 inch Dividers, with Pen and Pencil; 4 inch Plain Dividers; Drawing Pen; Brass Protractor and Wood Rule each \$2 25
3356. Same as No. 3255, with Patent Pencil Point " 2 50
3257. Rosewood Case, Lock and Tray, with space for colors, containing: 6 inch Dividers, with Needle Point, Pen, Pencil and Bar; $3\frac{1}{2}$ inch Dividers, with Needle Point, Pen and Pencil; Plain Dividers, 5 inches long; Drawing Pen, Bone Handle; Scale, Brass and Horn Protractor " 3 00
3258. Same as No. 3257, with Patent Pencil Point " 3 25



3259.

3259. Rosewood Case, Lock and Tray, with space for colors, containing: 6 inch Dividers, with Needle Point, Pen, Pencil and Bar; $3\frac{1}{2}$ inch Dividers, with Needle Point, Pen and Pencil; 5 inch Plain Dividers; Drawing Pen, Bone Handle; Bow Pen, with Needle Point; Brass and Horn Protractors; Scale each \$4 00
3260. Same as 3259, with Patent Pencil Point " 4 25

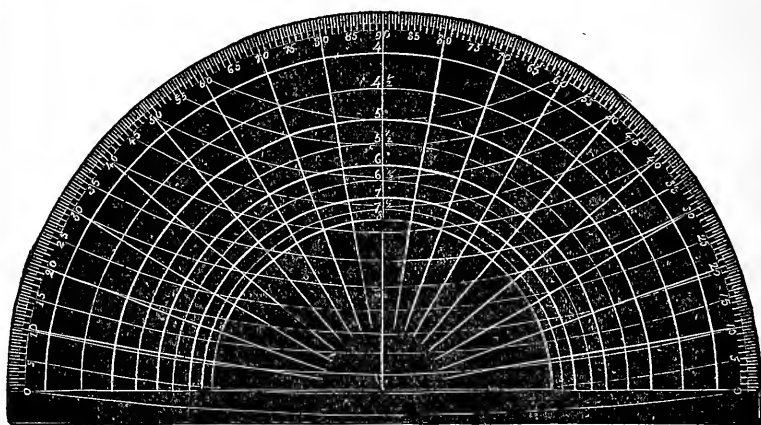


3261.

3261. Rosewood Case, Lock and Tray, with space below for colors, containing: $6\frac{1}{2}$ inch Proportional Dividers; 6 inch Dividers, with Needle Point, Pen, Pencil and Bar; $3\frac{1}{2}$ inch Dividers, with Needle Point, Pen and Pencil; 5 inch Plain Dividers; Drawing Pen, bone Handle; Brass and Horn Protractor and Scale each \$5 00
3262. Rosewood Box, containing: 6 inch Dividers, with Needle Point, Pen, Pencil and Lengthening Bar; $3\frac{1}{2}$ inch Dividers, with Needle Point, Pen and Pencil; 4 inch Plain Dividers; Proportional Dividers $6\frac{1}{2}$ inches long; Spring Bow Pen, with Needle Point; Brass and Horn Protractors; Drawing Pen, Scale " 6 50

Protractors.

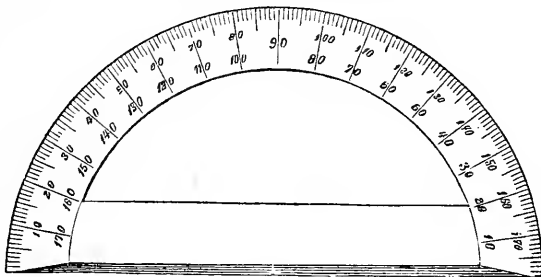
3275.	Horn Protractor,	$\frac{1}{2}$ circle,	single degrees,	4 inches diameter	each \$0	15
3276.	"	"	$\frac{1}{2}$ degree	5	"	25
3277.	"	"	"	6	"	30
3278.	"	"	"	7	"	50
3279.	"	"	"	8	"	75



3280.

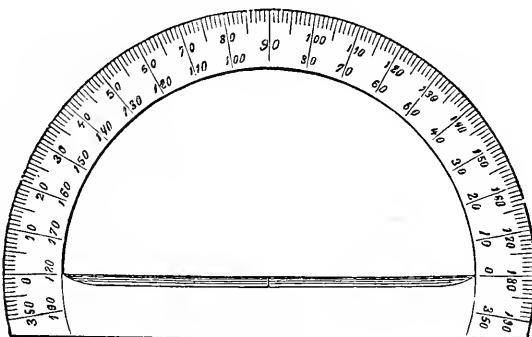
3280.	Railroad Curve Protractor, Horn,	8 inches diameter,	$\frac{1}{2}$ circle,	$\frac{1}{2}$ degrees, with curves varying $\frac{1}{4}^\circ$ from $\frac{1}{2}^\circ$ to 4° and $\frac{1}{2}^\circ$ from 4° to 8° , with radius of 400 feet to the inch	each \$1	60
3281.	Brass Protractor,	$\frac{1}{2}$ circle,	single degrees,	4 inch diameter	"	20
3282.	"	"	$\frac{1}{2}$ degrees	5	"	55
3283.	"	"	"	6	"	65
3284.	German Silver Protractor,	$\frac{1}{2}$ circle,	single degrees,	4 inches diameter	"	50
3285.	German Silver Protractor,	$\frac{1}{2}$ circle,	$\frac{1}{2}$ degrees,	5 inches diameter	"	85
3286.	"	"	"	6	"	1 00
3287.	"	"	"	7	"	1 15

FINE SWISS PROTRACTORS.



3290.

3290. German Silver Protractor, 4 inches diameter, $\frac{1}{2}$ circle, single degrees each \$1 50
3291. German Silver Protractor, 5 inches diameter, $\frac{1}{2}$ circle, $\frac{1}{2}$ degrees " 2 25
3292. " " $5\frac{1}{2}$ " $\frac{1}{2}$ " $\frac{1}{4}$ " " 3 00



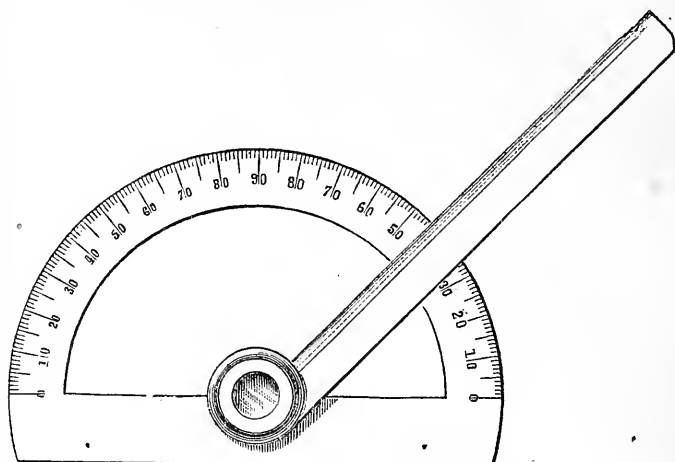
3293.

3293. German Silver Protractor, 4 inches diameter, $\frac{1}{2}$ circle, single degrees, inside centre each \$2 50
3294. German Silver Protractor, 5 inches diameter, $\frac{1}{2}$ circle, $\frac{1}{2}$ degrees, inside centre " 3 00
3295. German Silver Protractor, $5\frac{1}{2}$ inches diameter, $\frac{1}{2}$ circle, $\frac{1}{4}$ degrees, inside centre " 4 00

FINE SWISS PROTRACTORS, with Arm and Vernier.

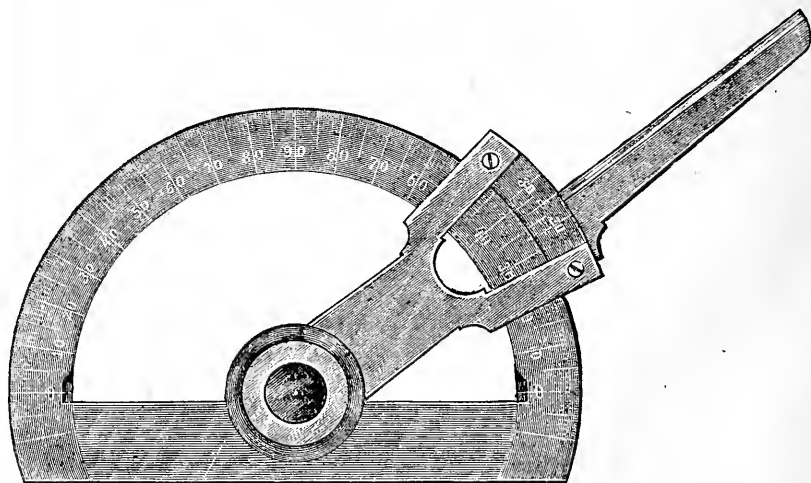
3296. German Silver Protractor, $5\frac{1}{2}$ inches diameter, $\frac{1}{2}$ circle, $\frac{1}{2}$ degrees, with Arm and Vernier, reading to 3 minutes each \$11 00
3297. German Silver Protractor, 8 inches diameter, $\frac{1}{2}$ circle, $\frac{1}{4}$ degrees, with Arm and Vernier, reading to one minute " 14 00
3298. German Silver Protractor, 10 inches diameter, $\frac{1}{2}$ circle, $\frac{1}{4}$ degrees, with Arm and Vernier, reading to one minute " 18 00

GERMAN SILVER PROTRACTORS.



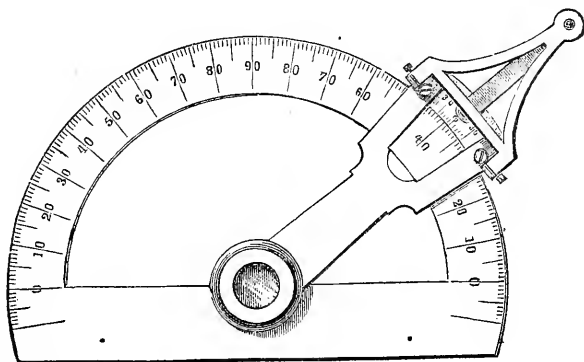
3299.

- | | | |
|-------|---|-------------|
| 3299. | German Silver Protractor, $\frac{1}{2}$ circle, $\frac{1}{2}$ degrees, with Arm and
Horn centre, 5 inches diameter | each \$6 50 |
| 3300. | German Silver Protractor, $\frac{1}{2}$ circle, $\frac{1}{2}$ degrees, with Arm and
Horn centre, 6 inches diameter | " 7 50 |
| 3301. | German Silver Protractor, $\frac{1}{2}$ circle, $\frac{1}{2}$ degrees, with Arm and
Horn centre, 7 inches diameter | " 9 00 |
| 3302. | German Silver Protractor, $\frac{1}{2}$ circle, $\frac{1}{2}$ degrees, with Arm and
Horn centre, 8 inches diameter | " 12 00 |
| 3303. | German Silver Protractor, whole circle, $\frac{1}{2}$ degrees, Arm and
Horn centre, 5 inches diameter | " 10 00 |



3305.

3304. German Silver Protractor, whole circle, $\frac{1}{2}$ degrees, Arm and Horn centre, 6 inches diameter each \$12 00
3305. German Silver Protractor, $\frac{1}{2}$ circle, $\frac{1}{2}$ degrees, with Arm and Vernier, reading to 3 minutes, 5 inches diameter " 11 00
3306. German Silver Protractor, $\frac{1}{2}$ circle, $\frac{1}{4}$ degrees, with Arm and Vernier, reading to one minute, 8 inches diameter " 14 00
3307. German Silver Protractor, $\frac{1}{2}$ circle, $\frac{1}{4}$ degrees, with Arm and Vernier, reading to one minute, 10 inches diameter " 18 00
3308. German Silver Protractor, whole circle, $\frac{1}{2}$ degrees, with Arm and Vernier, reading to three minutes, 5 inches diameter " 14 50
3309. German Silver Protractor, whole circle, $\frac{1}{4}$ degrees, with Arm and Vernier, reading to one minute, 8 inches diameter " 17 00
3310. German Silver Protractor, whole circle, $\frac{1}{4}$ degrees, with Arm and Vernier, reading to one minute, 10 inches diameter " 20 00



3311.

3311. German Silver Protractor, $\frac{1}{2}$ circle, $\frac{1}{2}$ degrees, with Arm, Dotter and Vernier, reading to three minutes, 6 inches diameter each \$18 00
3312. German Silver Protractor, $\frac{1}{2}$ circle, $\frac{1}{4}$ degrees, with Arm, Dotter and Vernier, reading to one minute, 8 inches diameter " 20 00

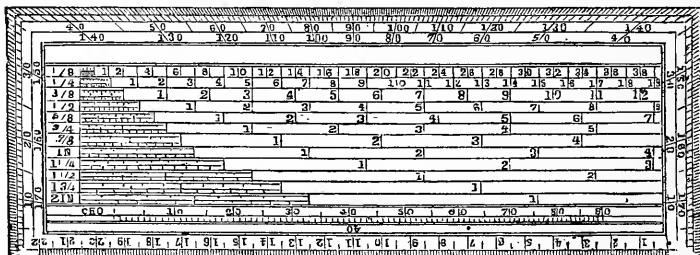
PROTRACTORS MADE TO ORDER.

PAPER PROTRACTORS.

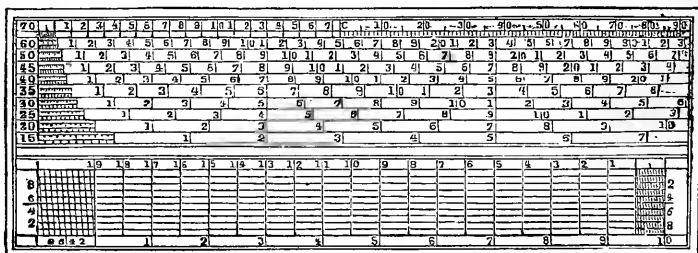
3315. Card Board Protractor, $\frac{1}{2}$ circle, single degrees, 4 inches diameter each \$0 10
3316. Card Board Protractor, $\frac{1}{2}$ circle, $\frac{1}{4}$ degrees, 8 inches diameter " 20
3317. " " whole circle, $\frac{1}{2}$ degrees, 8 inches diameter " 40
3318. Paper Protractor, whole circle, $\frac{1}{2}$ degrees, 12 inches diameter " 25

Ivory and Boxwood Scales.

3325. Ivory Plotting Scale, 6 inches long each \$0 75
3326. Ivory Chain Scale, 12 inches long, 10 and 50 parts to the inch " 3 00
3327. " " " 20 and 40 " " " " 3 00
3328. " " " 30 and 60 " " " " 3 00
3329. " " " 40 and 80 " " " " 5 25
3330. " " " 50 and 100 " " " " 5 25
3331. " " " 80 and 100 " " " " 5 75
3332. Ivory Scale for Architects, 12 inches long, divided into $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2, $2\frac{1}{4}$, $2\frac{1}{2}$, and 3 inches to the foot " 3 00
3333. Ivory Rectangular Protractor Scale, 6 inches long, $1\frac{1}{8}$ inches wide, divided on the face to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch to the foot, scale of chords, and on the edge from 0° to 180° ; reverse side, chain scales 30, 35, 40, 45, 50 and 60 parts to the inch, scale of chords and diagonal scale of $\frac{1}{100}$ ths " 1 50
3334. Ivory Rectangular Protractor Scale, 6 inches long, $1\frac{1}{8}$ inches wide; divided on the edge in half degrees from 0° to 180° , chain scale of 40 parts to the inch on the lower edge and scales of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$ and $1\frac{1}{2}$ inches to the foot, and scale of chords; reverse side, with chain scales 20, 25, 30, 35, 40, 45, 50 and 60 parts to the inch, scale of chords and diagonal scale of $\frac{1}{100}$ ths " 4 00

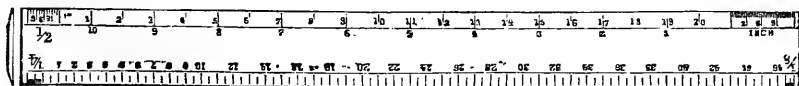


3335. FRONT SIDE.



3335. REVERSE SIDE.

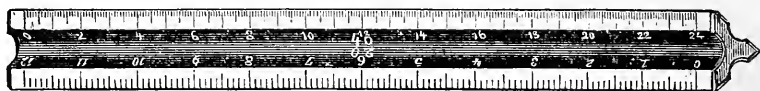
3335. Ivory Rectangular Protractor Scale, 6 inches long, $2\frac{1}{4}$ inches wide; divided on the edge in half degrees from 0° to 180° ; chain scale of 40 parts to the inch on the lower edge, and scale of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$ and 2 inches to the foot, and scale of chords; reverse side, with chain scales of 15, 20, 25, 30, 35, 40, 45, 50, 60 and 70 parts to the inch, scale of chords and diagonal scale of $\frac{1}{100}$ ths . . . each \$4 50
3336. Ivory Rectangular Protractor Scale, 8 inches long, 2 inches wide; divided on the edge, in half degrees from 0° to 180° ; chain scales of 40 parts to the inch on lower edge, scale of chords and scales of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 inch to the foot; reverse side, with chain scales of 30, 35, 40, 45, 50 and 60 parts to the inch, scale of chords and diagonal scale of $\frac{1}{100}$ ths " 5 00
3337. Ivory Rectangular Protractor Scale, 12 inches long, $2\frac{1}{2}$ inches wide, divided on the edge from 0° to 180° ; chain scale of 40 parts to the inch on the lower edge, scales of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$ and 2 inches to the foot, scale of chords; reverse side, chain scales of 15, 20, 25, 30, 35, 40, 45, 50, 60 and 70 parts to the inch, scale of chords and diagonal scale of $\frac{1}{100}$ ths . . . " 11 50
3340. Boxwood Plotting Scale, 6 inches long . . . " 15
3341. " Rectangular Protractor Scale, 6 inches long . . . " 50
3342. Flat Boxwood Chain Scale, 12 inches long, divided 10 and 50 parts to the inch . . . " 1 25
3343. Flat Boxwood Chain Scale, 12 inches long, divided 20 and 40 parts to the inch . . . " 1 25
3344. Flat Boxwood Chain Scale, 12 inches long, divided 30 and 60 parts to the inch . . . " 1 25
3345. Flat Boxwood Chain Scale, 12 inches long, divided 40 and 80 parts to the inch . . . " 1 75
3346. Flat Boxwood Chain Scale, 12 inches long, divided 50 and 100 parts to the inch . . . " 1 75
3347. Flat Boxwood Chain Scale, 12 inches long, divided 80 and 100 parts to the inch . . . " 2 25
3348. Flat Boxwood Off Set Scales, 2 inches long, to match 3342, 3343 and 3344 . . . " 35
3349. Flat Boxwood Scale, 6 inches long, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 inch to the foot . . . " 75



3350.

3350. Flat Boxwood Scale, 12 inches long, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 inch to the foot . . . each \$1 25
3351. Flat Boxwood Scale, 24 inches long, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 inch to the foot . . . " 3 00
3352. Flat Boxwood Scale, 12 inches long, divided $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$ and 3 inches to the foot . . . " 1 25

3353. Flat Boxwood Scale, 24 inches long, divided $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$ and 3 inches to the foot each \$3 00
3354. Beveled Boxwood Scale, 12 inches long, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 inch to the foot; reverse side $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$ and 3 inches to the foot " 1 50
3355. Triangular Boxwood Scale, 6 inches long, divided 10, 20, 30, 40, 50 and 60 parts to the inch " 1 50



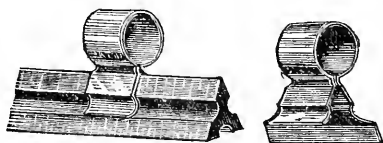
3356.

3356. Triangular Boxwood Scale, 12 inches long, divided 10, 20, 30, 40, 50 and 60 parts to the inch each \$2 00
3357. Triangular Boxwood Scale, 12 inches long, divided 20, 30, 40, 50, 60 and 80 parts to the inch " 2 00
3358. Triangular Boxwood Scale, 24 inches long, divided 10 to 60 or 20 to 80 parts to the inch " 5 00
3359. Triangular Boxwood Scale, 6 inches long, divided $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$ and 3 inches to the foot, and one edge $\frac{1}{16}$ of an inch " 1 50



3360.

3360. Triangular Boxwood Scale, 12 inches long, divided $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$ and 3 inches to the foot, and one edge $\frac{1}{16}$ of an inch each \$2 00
3361. Triangular Boxwood Scale, 24 inches long, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 2, 3 and 4 inches to the foot, and one edge $\frac{1}{16}$ of an inch " 5 00
3362. Silver Plated Triangular Scale, 12 inches long, divided $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$ and 3 inches to the foot, and one edge $\frac{1}{16}$ of an inch " 5 00
3363. Silver Plated Triangular Scale, 12 inches long, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch to the foot " 5 00
3364. Silver Plated Triangular Scale, 12 inches long, divided 10, 20, 30, 40, 50 and 60 parts to the inch " 5 00
3365. Gunter Scale, 12 inches long " 75
3366. " " 24 " " 1 25
3367. Boxwood School Rule, 12 inches long, $\frac{1}{8}$ and $\frac{1}{16}$ inch " 15
3368. " " " " Beveled Brass Edge, $\frac{1}{16}$ inch " 60
3369. Boxwood School Rule, 18 inches long " 90

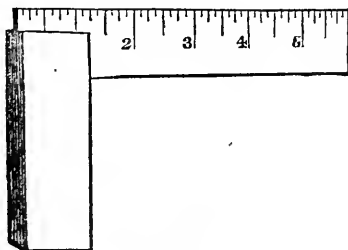


3370.

3370. Triangular Scale Guard each \$0 25
3375. Paper Scales, 19 inches long, $1\frac{3}{4}$ inches wide ; Series A, $\frac{1}{4}$, $\frac{1}{2}$,
 $\frac{3}{4}$, 1, $1\frac{1}{2}$ and 3 inches to the foot per set 1 00
3376. Paper Scales, Series B, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{8}$ of an inch to the foot " 1 00
3377. " " C, 10, 20, 30, 40, 50 and 60 parts to the
 inch " 1 00
3378. Paper Scales of the above series each 20

Standard Steel Rules.

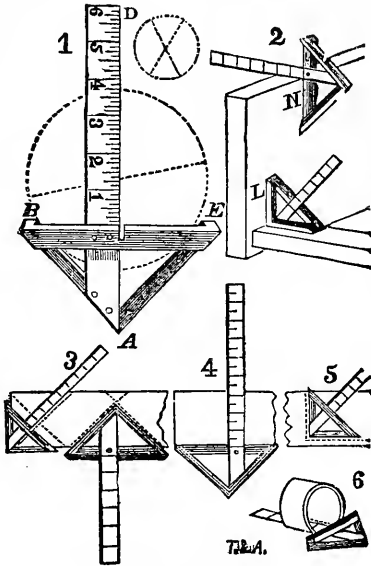
3380. 3 inch Steel Rule, divided $\frac{1}{8}$, $\frac{1}{10}$, $\frac{1}{12}$, $\frac{1}{16}$, $\frac{1}{20}$, $\frac{1}{24}$, $\frac{1}{32}$, $\frac{1}{48}$, $\frac{1}{50}$, $\frac{1}{64}$
 and $\frac{1}{120}$ th of an inch each \$0 60
3381. 4 inch Steel Rule, divided as above " 90
3382. 6 " " " " " 1 20
3383. 9 " " " " " 1 80
3384. 12 " " " " " 2 50
3385. 18 " " " " " 3 60
3386. 24 " " " " " 4 80
3387. Steel Shrink Rule, $24\frac{1}{4}$ inches long, divided on each side 10, 20,
 50, 100, 12, 24, 48, 16, 32, 64 parts of an inch " 6 00
3388. Boxwood Shrink Rule, same divisions as above " 3 60
3389. Steel Square, 2 inches long, $\frac{1}{20}$ inch thick, divided 16ths and
 64ths on one side, and 32nds and 64ths on the other side " 1 80
3390. Steel Square, 3 inches long, $\frac{1}{8}$ inch thick, divided as above " 2 40
3391. " 4 " $\frac{1}{4}$ " divided 16th and
 32nds on both sides " 2 50
3392. Steel Square, 6 inches long, $\frac{1}{4}$ inch thick, divided 16ths and
 32nds on both sides " 3 50
3393. Steel Square, 8 inches long, $\frac{1}{2}$ inch thick, divided 16ths and
 32nds on both sides " 4 50
3394. Steel Square, 10 inches long, $\frac{1}{2}$ inch thick, divided 16ths and
 32nds on both sides " 5 50



3395.

3395. Steel Square, with heavy head for Machinists, divided to 32ds
 3 inch blade each \$2 50

3396.	Same as 3395, 4 inch blade	each \$3 00
3397.	" 6 "	" 4 00
3398.	" 9 "	" 7 00
3399.	" 12 "	" 8 00



This square combines, in the most convenient form, five different instruments ;
T Square, Try Square, Mitre, Graduated Rule and the Centre Square ; Divided 12ths and 48ths on one edge and 16ths and 32nds on the other edge.

3400.	Universal Square, 4 inch blade	each \$2 50
3401.	Universal Square, 6 inch blade	" 3 00
3402.	Universal Square, 12 inch blade	" 7 00

3403.	Steel T Square, fixed head, 8 inches long, blade 24 inches long, $\frac{7}{8}$ inch wide, and $\frac{3}{4}$ inch thick	each \$6 00
3404.	Steel T Square, fixed head, 8 inches long, blade 36 inches long, $\frac{7}{8}$ inch wide, and $\frac{3}{4}$ inch thick	" 7 00
3405.	Steel T Square, with $4\frac{1}{2}$ inch Arc, divided to half degrees, head $8\frac{1}{4}$ inches long, blade $1\frac{1}{4}$ inches wide, $\frac{3}{4}$ inch thick, and 36 inches long	" 14 00



3406.

3406.	American Wire Gauge, small size	each	\$3 00
3407.	" " large "	"	4 00
3408.	Steel Triangle, 30°, 60° and 90°, 6 inch perpendicular	"	3 25
3409.	" " " 10 "	"	4 25
3410.	" 45° and 90° 5 inch perpendicular	"	3 25
3411.	" " 8 "	"	4 25

Straight Edges.



3420. Cherry or Maple Straight Edges, one edge beveled.

	12	18	24	30	36	42	48	60	inches long.
Each	.15	.20	.25	.30	.40	.50	.60	.75	cents.



3421. Mahogany, Ebony Lined, Straight Edges, one edge beveled.

	24	30	36	42	48	inches long.
Each	.70	.90	\$1.20	\$1.50	\$2.00	



3422. Hard Rubber Straight Edges.

	12	18	24	30	36	42	inches long.
Each	.60	.90	\$1.35	\$1.60	\$2.00	\$2.50	

3423. Steel Straight Edges.

	6	12	18	24	36	48	inches long.
Each	.75	\$1.50	\$2.25	\$3.00	\$6.00	\$9.00	

3424. Steel Straight Edges, one edge beveled.

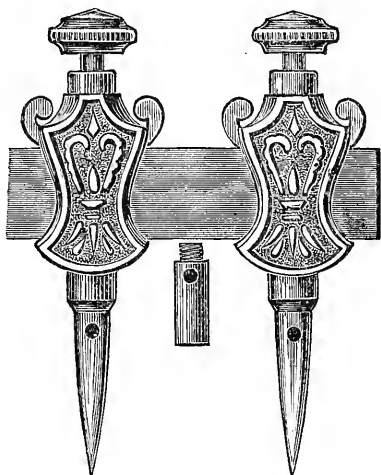
	18	24	30	36	42	48	60	72	inches long.
Each	\$1.50	\$2.75	\$3.50	\$4.50	\$5.25	\$6.00	\$9.00	\$11.50	

3425. Steel Straight Edges, one edge beveled, Nickel Plated.

	18	24	30	36	42	48	60	72	inches long.
Each	\$1.75	\$3.00	\$4.00	\$5.00	\$6.00	\$8.00	\$10.50	\$14.00	

3426. Improved Vernier Caliper, reading to $\frac{1}{1000}$ ths of an inch, and reverse side 64ths of an inch, or reading with Vernier to 20ths of a millimeter, 6 inch each \$20 00

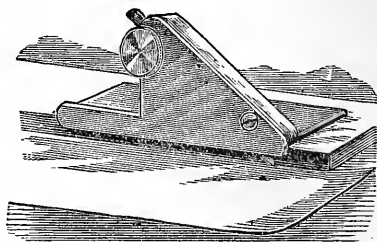
3427. Improved Vernier Caliper, 12 inch " 25 00



3428.



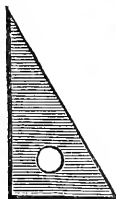
3432.



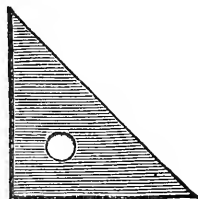
3434.

3428.	Improved Trammel Points, small	each	\$1 50
3429.	“ “ medium	“	2 00
3430.	“ “ large	“	2 75
3431.	Speed Indicator	“	2 00
3432.	Brass Swivels for T Squares	“	50
3433.	“ “ Nickel Plated	“	75
3434.	Paper Cutter	“	50

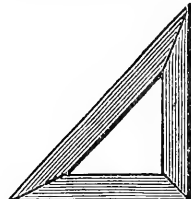
Triangles.



3440.



3441.



3443.



3442.

3440.	Wood Triangles, solid angles of 30°, 60° and 90°.							
	4	5	6	7	8	10	12	14 inch perpendicular.
	.10	.10	.10	.10	.15	.15	.20	.25 cents each.
3441.	Wood Triangles, solid; Angles of 45° and 90°.							
	4	5	6	8	10	inch perpendicular.		
	.10	.15	.15	.20	.25	cents each.		

3442. Wood Triangles, open centre ; Angles of 30° , 60° and 90° .

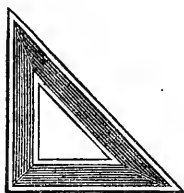
5	6	7	8	9	10	12	inch perpendicular.
.20	.20	.25	.25	.30	.35	.75	cents each.

3443. Wood Triangles, open centre; Angles of 45° and 90° .

4	5	6	7	8	9	10	12	14	inch perpendicular.
.20	.20	.25	.30	.35	.40	.45	.60	.75	cents each.



3444.



3445.

3444. Wood Triangles, open centre, Mahogany, lined with Ebony,
Angles of 30° , 60° and 90° .

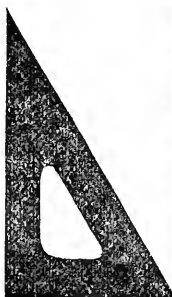
6	7	9	11	13	15	inch perpendicular.
.50	.60	.70	.80	\$1.00	\$1.25	each.

3445. Wood Triangles, open centre, Mahogany, lined with Ebony,
Angles of 45° and 90° .

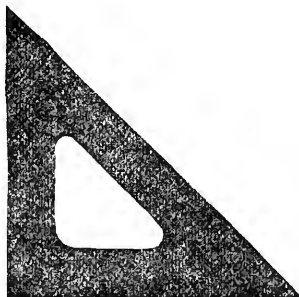
5	6	8	10	12	14	inch perpendicular.
.50	.60	.70	.80	\$1.00	\$1.25	each.



3446.



3447.



3448.

3446. Hard Rubber Triangles, open centre ; Angles of $22\frac{1}{2}^\circ$, $67\frac{1}{2}^\circ$ and 90° .

5	6	7	8	9	10	11	12	13	14	15	16 inch perpendicular.
.30	.35	.40	.50	.60	.70	.80	.90	\$1.10	\$1.25	\$1.50	\$1.75 each.

3447. Hard Rubber Triangles, open centre; Angles of 30° , 60° and 90° .

4	5	6	7	8	9	10	11	12	13	14	15	16 inch perpendicular.
.25	.30	.35	.40	.50	.60	.70	.80	.90	\$1.10	\$1.25	\$1.50	\$1.75 each.

3448. Hard Rubber Triangles, open centre ; Angles of 45° and 90° .

4	5	6	7	8	9	10	11	12	13	14	15	inch perpendicular.
.35	.40	.45	.55	.70	.85	\$1.00	\$1.15	\$1.25	\$1.50	\$1.75	\$2.00	each.

3449. Hard Rubber Lettering Triangles, $3\frac{1}{2}$ inch perpendicular, 3 in
a set, per set \$1.25 each \$0 50

Irregular Curves.

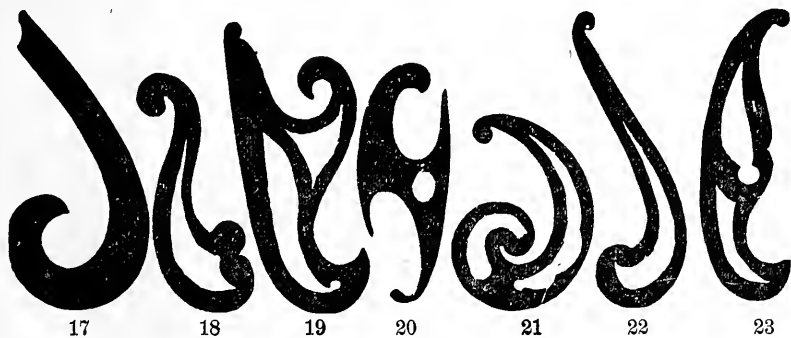
PATTERN A.



3450.

3450. Irregular Curves, Pattern A, Cherry or Maple; No. 1, 10 cents each; Nos. 2, 3, 4, 5, 7, 9, 11 and 12, 15 cents each; Nos. 6, 8, 10, 13, 14, 15 and 16, 25 cents each; Nos. 17, 18, 20 and 21, 30 cents each. Nos. 19, 22 and 23, 35 cents each; No. 24 and 25, 50 cents each.
3451. Irregular Curves, Pattern A, Rubber; Nos. 1, 2 and 3, 30 cents each; Nos. 4, 5, 6 and 12, 35 cents each; Nos. 7, 8, 9, 10, 11, 13, 15 and 16, 50 cents each; Nos. 14, 17 and 20, 65 cents each; Nos. 18, 19, 21 and 22, 75 cents each; Nos. 23 and 24, \$1 each; No. 25, \$1.50 each.

PATTERN B.

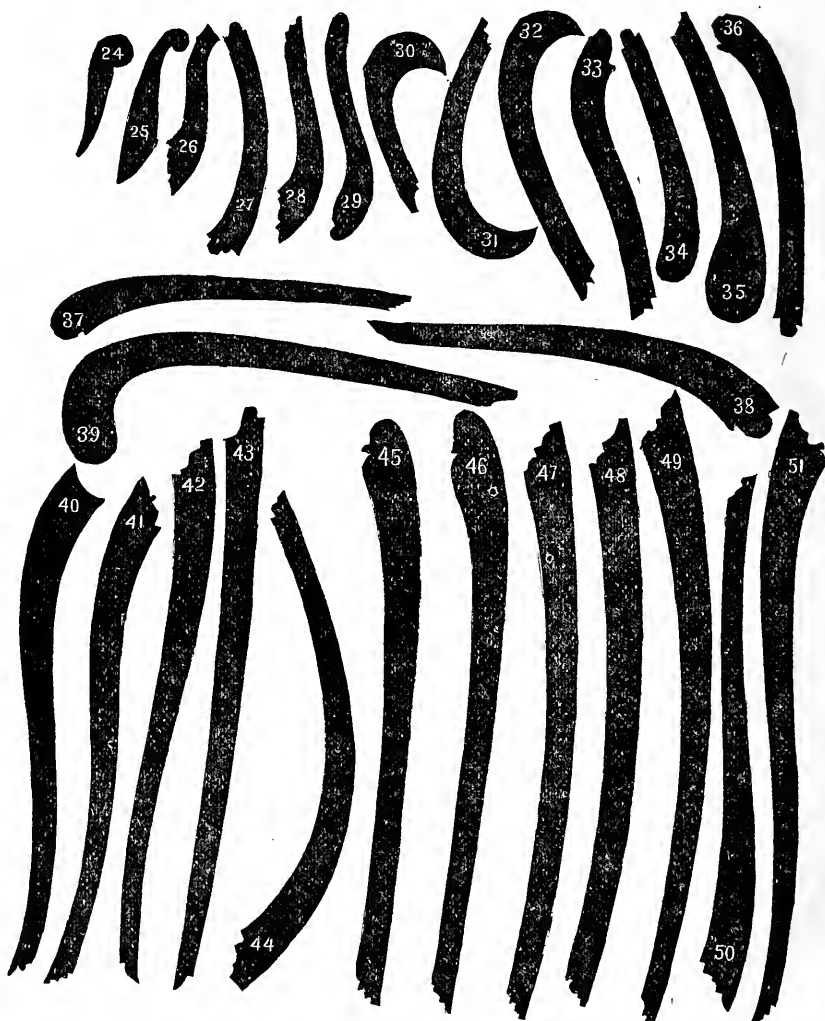


3452.

3452. Irregular Curves of Hard Rubber, Pattern B; No. 1, 20 cents; Nos. 2 and 5, 35 cents each; Nos. 3, 4, 6 and 8, 40 cents each; Nos. 7, 9, 10, 11, 12, 13 and 14, 50 cents each; No. 15, 16, 18 and 22, 65 cents each; Nos. 20 and 21, 75 cents each; Nos. 17, 19 and 23, \$1 each.

Ship Curves.

PATTERN C.

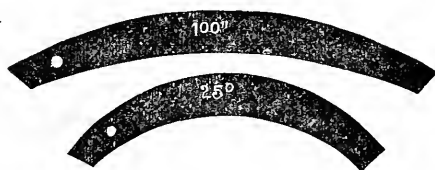


3455.

3455. Ship Curves, Wood; Pattern C, from 24 to 51, 28 in a set,
 in case per set \$13 00
3456. Ship Curves, Hard Rubber; Pattern C, from 24 to 51, 28
 in a set, in case " 20 00

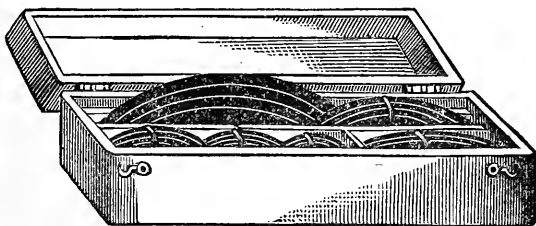
3457. Copenhagen Ship Curves, of Wood, 43 in a set, in Walnut Case per set \$18 00
3458. Copenhagen Ship Curves, of Hard Rubber, 43 in a set, in Walnut Case " 35 00

Railroad Curves.



3460.

3460. Set of 10 Wood Curves, from 12 to 120 inches radius, varying 12 inches, finished on convex side only per set \$4 25
3461. Set of 10 Hard Rubber Curves, from 12 to 120 inches radius, varying 12 inches, finished on convex side only " 8 00
3462. Set of 43 Wood Curves, from $3\frac{1}{2}$ to 200 inches radius, Varying $\frac{1}{2}$ in. from $3\frac{1}{2}$ to 10 inches. Varying 6 in. from 42 to 90 inches
- | | | | | | | | | |
|---|---|---|----------|---|----|---|------------|---|
| " | 2 | " | 10 to 24 | " | 10 | " | 90 to 140 | " |
| " | 3 | " | 24 to 42 | " | 20 | " | 140 to 200 | " |
- Per set, in box, \$16 00.
3463. Set of 43 Hard Rubber Curves, same as 3462, in box per set \$27 50



3464.

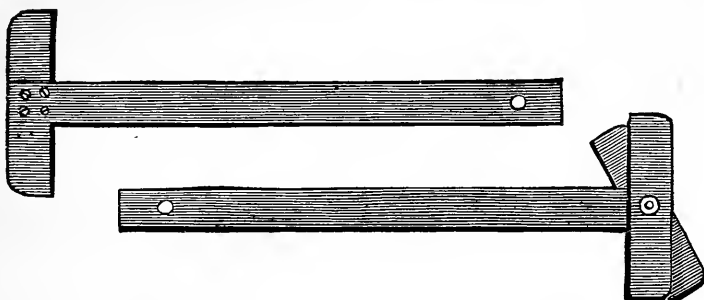
3464. Set of 100 Hard Rubber Curves, from 2 to 100 inches radius, varying $\frac{1}{2}$ inch, from 2 to $3\frac{1}{2}$ inches, and 1 inch, from 4 to 100 inches, finished on convex and concave arcs per set \$70 00
3465. Set of 30 Hard Rubber Curves, to a scale of 50 feet to the inch, varying half degrees, from 30 minutes to 10 degrees, finished on convex and concave sides " 16 00

3466.	Set of 50 Hard Rubber Curves, to a scale of 50 feet to the inch, from 25 minutes to 3 degrees by every 5 minutes, and from 3 to 5 degrees by every 15 minutes, and from 5 to 10 degrees by every $\frac{1}{2}$ degree, with 3 minute tangent, finished on convex and concave sides	per set \$50 00
3467	Set of 70 Hard Rubber Curves, to a scale of 100 feet to the inch, from 15 minutes to 4 degrees by every 5 minutes, and from 4 to 10 degrees by every 15 minutes, finished on both sides	" 46 00
3468	Set of 20 Hard Rubber Curves, scale of 400 feet to the inch, from 30 minutes to 10 degrees by every 30 minutes, finished on both sides	" 13 00
3469	Set of 70 Hard Rubber Curves, scale of 400 feet to the inch, from 15 minutes to 4 degrees by every 5 minutes, and from 4 to 10 degrees by every 15 minutes, finished on the convex side only	" 46 00
3470	Set of 30 Wood Curves of 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190 and 200 centimeters radius	" 10 00
3471	Set of 30 Hard Rubber Curves of 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190 and 200 centimeters radius	" 18 50
3472	Set of 30 Wood Curves of 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1050, 1100, 1150, 1200, 1250, 1300, 1350, 1400, 1450 and 1500 centimeters radius	" 12 00
3473.	Set of 30 Hard Rubber Curves of 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1050, 1100, 1150, 1200, 1250, 1300, 1350, 1400, 1450 and 1500 centimeters radius	" 21 00
3474.	Set of 20 Hard Rubber Curves of 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900 and 2000 centimeters radius	" 18 00
3474 A.	Set of 76 Hard Rubber Curves of $2\frac{1}{2}$, 5, $7\frac{1}{2}$, 10, $12\frac{1}{2}$, 15, $17\frac{1}{2}$, 20, $22\frac{1}{2}$, 25, $27\frac{1}{2}$, 30, $32\frac{1}{2}$, 35, $37\frac{1}{2}$, 40, $42\frac{1}{2}$, 45, $47\frac{1}{2}$, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 220, 240, 260, 280, 300, 325, 350, 375, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1050, 1100, 1150, 1200, 1250, 1300, 1350, 1400, 1450, 1500, 1600, 1700, 1900, 2000 centimeters radius	" 60 00

These curves can be furnished in Cardboard, Wood or Hard Rubber.

Curves of any radius and to any scale made to order.

T Squares.



3475.

3476.

3475. Cherry or Maple, with Fixed Head.

15	20	24	30	36	42	48	60	inches long.
Each .30	.40	.50	.60	.75	.85	\$1.00	\$1.25.	

3476. Cherry or Maple, with Shifting Head.

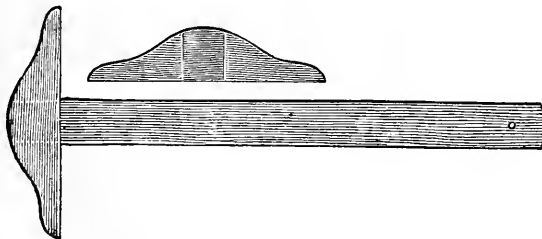
20	24	30	36	42	48	60	inches long.
Each \$1.00	\$1.10	\$1.20	\$1.35	\$1.50	\$1.75	\$2.25.	

3477. Cherry or Maple Blade, Fixed Walnut Head.

20	24	30	36	42	48	60	inches long.
Each .45	.55	.65	.80	.95	\$1.15	\$1.40	

3478. Cherry or Maple Blade, Shifting Walnut Head.

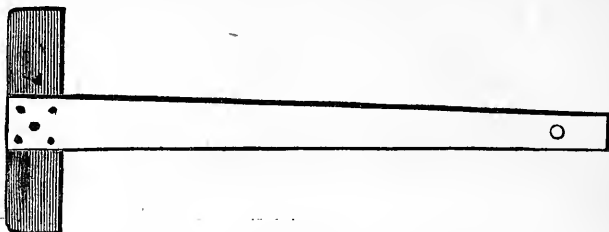
20	24	30	36	42	48	60	inches long.
Each \$1.10	\$1.20	\$1.35	\$1.50	\$1.60	\$2.00	\$2.50.	



3479.

3479. Cherry or Maple, with Dovetail Head.

20	24	30	36	42	inches long.
Each .50	.60	.75	.90	\$1.10.	



3480.

3480. Maple Blade, tapered, Black Walnut Head.

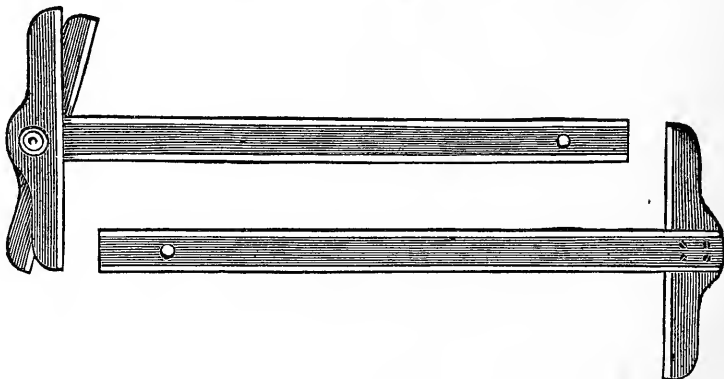
24	30	36	42	48 inches long.
Each \$1.00	\$1.25	\$1.50	\$1.75	\$2.00



3481.

3481. Hard Rubber Blade, tapered, Satin Wood Head.

24	30	36	42 inches long.
Each \$2.50	\$3.00	\$3.50	\$4.00



3482.

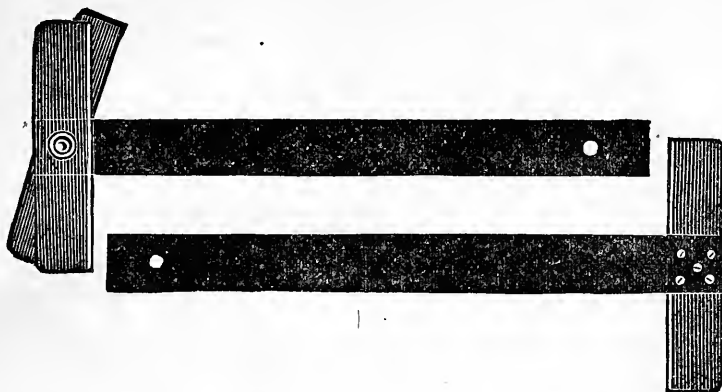
3483.

3482. Mahogany, Ebony Lined, Fixed Head.

24	30	36	42	48	60 inches long.
Each \$1.25	\$1.50	\$1.75	\$2.10	\$2.50	\$4.00.

3483. Mahogany, Ebony Lined, Shifting Head.

24	30	36	42	48	60 inches long.
Each \$2.25	\$2.50	\$2.75	\$3.10	\$3.50	\$5.00.



3484.

3485.

3484. Hard Rubber Blade, Fixed Walnut Head.

12	18	24	30	36	42 inches long.
Each .70	\$1.10	\$1.75	\$2.25	\$2.75	\$3.25.

3485. Hard Rubber Blade, Shifting Walnut Head.

12	18	24	30	36	42 inches long.
Each \$1.30	\$1.75	\$2.75	\$3.25	\$3.75	\$4.25.

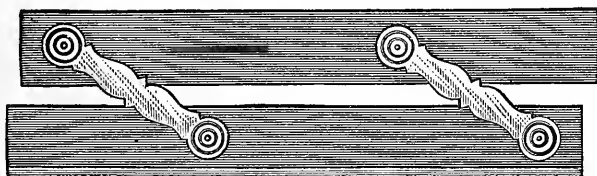
3486. Perspective Linead, Cherry, lined with Hardwood.

18	24	30	36 inches long.
Each \$2.50	\$3.50	\$4.50	\$5.50.

3487. Pantographs each \$3 00

3488. " of Hard Wood " 5 50

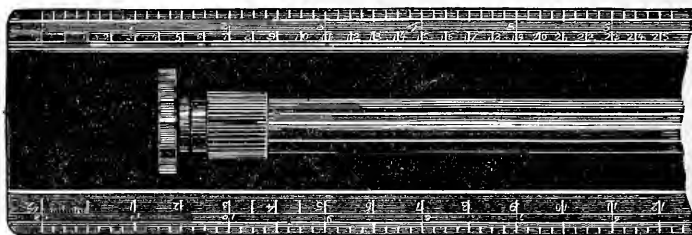
Parallel Rules.



3490.

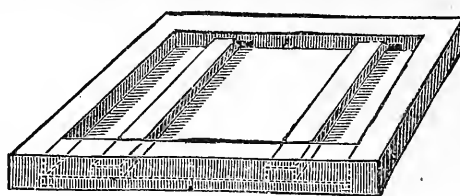
3490.	Parallel Rule, Ebony, Brass mounted,	6 inches long	.	each \$0 25
3491.	"	"	"	9 " . " 50
3492.	"	"	"	12 " . " 75
3493.	"	"	"	15 " . " 1 00
3494.	"	"	"	18 " . " 1 25

Rolling Parallel Rules.



3497.

3495.	Parallel Rule, Ebony, Brass rollers, 12 inches long . . .	each \$3 25
3496.	“ “ “ 18 “ . . .	“ 5 00
3497.	“ “ 12 inches long, Ivory edge, divided to 16ths, Brass rollers . . .	“ 5 00
3498.	Parallel Rule, Ebony, 18 inches long, Ivory edge, divided to 16ths, Brass rollers . . .	“ 7 50
3499.	Parallel Rule, Brass, 12 inches long, on rollers . . .	“ 8 00
3500.	“ “ 15 “ “ . . .	“ 10 00
3501.	“ German Silver, 12 inches long, on rollers . . .	“ 10 00
3502.	“ “ 18 “ “ . . .	“ 15 00
3505.	Blunk's Patent Section Liner, the best instrument for this pur- pose that is made, being easily operated and is not liable to get broken . . .	“ 8 00
3506.	Bergner's Patent Section Liner, not so good or durable as Blunk's . . .	“ 7 50
3507.	Gardam's Patent Proportional Parallel Rule, T Square and Section Liner, with Arc $4\frac{1}{2}$ inches diameter, graduated to half degrees, with clamp, blade 36 inches long . . .	“ 25 00



3512.

3512. Drawing Board with movable centre of Pine and frame of Walnut :

10½ x 17 inches, inside measure	each \$ 2 0
14 x 19 " "	" 2 7½
16 x 21 " "	" 3 7
18 x 26 " "	" 5 0

DRAWING BOARDS MADE TO ORDER.

3515. Drawing Table, Walnut top, 22 x 26 inches, with shelf 7 x 26 inches, 2 drawers, Iron stand on castors, adjustable elevation for the top each \$12 5

3516. Drawing Table similar to 3515 but with Polished Walnut top and Bronzed stand " 15 0

TRESTLES FOR DRAWING BOARDS FURNISHED TO ORDER.

Drawing Pins or Thumb Tacks



3526.

3528.

3532.

3539.

3525.	Brass $\frac{3}{8}$ inch, flat head	per doz. \$0 1
3526.	" $\frac{5}{16}$ " round head, milled edge	" 25
3527.	" $\frac{3}{8}$ " " "	" 30
3528.	" $\frac{1}{2}$ " " "	" 35
3529.	" $\frac{5}{8}$ " " "	" 50
3530.	German Silver, $\frac{3}{8}$ inch beveled edge, flat head	" 50
3531.	" $\frac{1}{2}$ " " "	" 60
3532.	" $\frac{5}{8}$ " " "	" 75
3533.	Steel, $\frac{5}{8}$ inch, round head, milled edge	" 50
3534.	German Silver, $\frac{3}{8}$ inch, flat head, round	" 60
3535.	" $\frac{1}{2}$ " " "	" 70
3536.	" $\frac{5}{8}$ " " "	" 80

ALTENER'S TACKS.

Pins screwed into the head and carefully made.

3537.	German Silver, $\frac{3}{8}$ inch, flat head, beveled edge	per doz. \$0 90
3538.	" $\frac{1}{2}$ " " "	" 1 20
3540.	Thumb Tack Lifter, Nickel Plated	each 25

COMMON SENSE THUMB TACK.



I take pleasure in offering to you

THE

"COMMON SENSE" THUMB TACK,

Being the Cheapest and Safest Thumb Tack ever offered in this market. Impossible to injure the hands by the centre pin penetrating—as it is so constructed that the top comes between the hand and the pin.

Put up in neat cases of one gross each. Sent by mail (postage paid) on receipt of price.

1 Gross (12 doz. mounted on cards, 6-16, \$1.00.

" " " " 7-16, 1.50.

SINGLE DOZEN, 6-16..... 15 Cts. Per Doz.

ENCLOSED PLEASE FIND SAMPLES.

SINGLE DOZEN, 7-16..... 20 Cts. Per Doz.

YOURS TRULY,

F. W. McALLISTER,

3 N. CHARLES ST.,

BALTIMORE, MD.

~~Send~~ Send One Dollar for Sample Gross.

THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

• 1960-1961

RESEARCH REPORT

1961

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THE UNIVERSITY OF CHICAGO

Drawing Paper.

WHATMAN'S PAPERS IN SHEETS, HOT AND COLD PRESSED. SELECTED
BEST.

			per quire.	per sheet.
3550.	Demy,	15 x 20 inches	\$ 1 00	\$0 06
	Medium,	17 x 22 "	1 50	08
	Royal,	19 x 24 "	1 85	10
	Super Royal,	19 x 27 "	2 40	12
	Imperial,	21 x 30 "	3 50	20
	Atlas,	26 x 33 "	4 50	25
	Double Elephant,	26 x 40 "	5 50	30
	Antiquarian,	31 x 52 "	30 00	1 50

Hot Pressed has smooth surface.

Cold Pressed has slight grain. In ordering please state which is wanted.

DRAWING PAPER IN ROLLS.

			per roll of 10 yds.	per yd.
3551.	White 36 inches wide, Thin,	45 lbs.	\$2 25	\$0 25
	" 42 " Medium, "	. . . . .	3 00	35
	" 58 " Thick, "	. . . . .	5 00	60
3552.	Eggshell, 42 inches wide, Medium, "	. . . . .	3 00	35
	" 58 " Thin, "	. . . . .	3 75	40
	" 58 " Medium, "	. . . . .	4 00	45
	" 58 " Thick, "	. . . . .	4 50	50
3553.	Leonine, 62 " Medium, "	. . . . .	4 50	50
	Paragon, 42 " " "	. . . . .	3 00	35
	" 58 " " "	. . . . .	4 00	45
	" 58 " Thick, "	. . . . .	5 00	60

Full unbroken Rolls of 30 to 40 pounds *only* sold at pound rates.

MOUNTED DRAWING PAPERS.

			Sheet.
3554.	Whatman's Double Elephant	. . . . .	\$0 75
	" Antiquarian	. . . . .	1 75

In Rolls of 10 yards.

			per roll.	per yard.
3555.	White, 36 inches wide, Thin	. . . . .	\$ 8 00	\$ 85
	" 42 " Medium	. . . . .	9 00	1 00
	" 58 " "	. . . . .	12 00	1 40
3556.	Eggshell, 42 inches wide, Medium	. . . . .	9 00	1 00
	" 58 " Thin	. . . . .	12 00	1 40
	" 58 " Medium	. . . . .	12 50	1 40
	" 58 " Thick	. . . . .	13 50	1 60

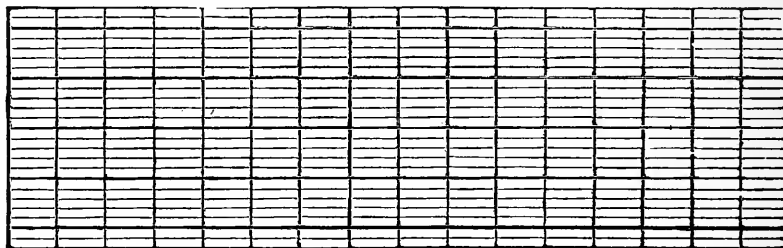
				per roll.	per yd.
3557.	Leonine, 62 inches wide, Medium	.	.	\$13 50	\$1 60
	Paragon, 42	"	"	9 00	1 00
	" 58	"	"	12 50	1 40
	" 58	"	Thick	13 50	1 60
3358.	Buff Paper English, 40 inches wide	.	.	per lb. 50	per yd. 25
	" " " 54	"	"	50	35
3559.	American Manilla Paper for Drawings.				
	36 inches wide	.	.	per lb. \$0 15	per yd. \$0 10
	40	"	.	15	12
	48	"	.	15	15
	54	"	.	15	18

Full Rolls only of 70 to 100 pounds sold at the pound rates.

Profile Paper.

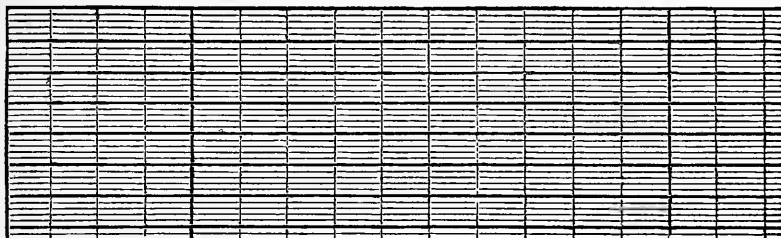
The Profile Papers offered are the best that can be made, being printed from the most correct rollers and on better quality paper than was ever offered, standing erasing very well, and also taking the ink after erasing without running.

These Papers are printed in Orange and Green.



3560.

3560. Profile Paper, Plate A, in sheets, ruled 15 x 42 inches ; horizontal divisions 4 to the inch, vertical divisions 20 to the inch ; with every tenth horizontal and every fiftieth vertical division line ruled heavier than the others, per sheet, 40 cents per quire \$8 50
3561. Profile Paper, Plate AA. In sheets, ruled 6½ x 42 inches, with same divisions as 3560, per sheet 30 cents " 6 50



3562.

3562. Profile Paper, Plate B. In sheets, ruled 13 x 42 inches ; horizontal divisions 4 to the inch, vertical divisions 30 to the inch ; with every fourth horizontal and every twenty-fifth vertical division line ruled heavier than the others, per sheet, 40 cents per quire \$8 50
3563. Profile Paper, Plate B. In sheets, ruled $6\frac{1}{2}$ x 42 inches with same divisions as 3562, per sheet, 30 cents " 6 50
3564. Profile Paper, Plate C. In sheets, ruled 15 x 42 inches ; horizontal divisions 5 to the inch, vertical divisions 25 to the inch ; with every fifth horizontal and every twenty-fifth vertical line ruled heavier than the others, per sheet, 40 cents " 8 50

CONTINUOUS PROFILE PAPER IN ROLLS OF 50 YARDS.

3565. Profile Paper, Plate A. 20 inches wide, in rolls . . . per yard \$0 30
3566. Profile Paper, Plate B. 20 inches wide, in rolls . . . " 30
3567. Profile Paper, Plate B. 9 inches wide, in rolls . . . " 20
3568. Profile Paper, Metric, ruled 50 centimetres wide in millimetres, with every fifth millimetre, each centimetre and each decimetre ruled heavier than the millimetres, in rolls " 30
3569. Profile Paper, Plate A. 20 inches wide, Mounted on Muslin, in rolls of 20 yards, per roll \$14.00 . . . " 75
3570. Profile Paper, Plate B. 20 inches wide, Mounted on Muslin, in rolls of 20 yards, per roll \$14.00 . . . " 75
3571. Profile Paper, Plate B. 9 inches wide, Mounted on Muslin, in rolls of 20 yards, per roll \$9.00 . . . " 50
3572. Metric Profile Paper, 50 centimetres wide, Mounted on Muslin, in rolls of 20 yards, per roll \$14.00 . . . " 75

CROSS SECTION PAPERS.

Printed in Orange and Green.

3575.	Topographical Paper, 14 x 17 inches, ruled 400 feet to the inch, per quire \$1.75	per sheet \$0 10
3576.	Trautwine's Cross Section and Diagram, 10 feet to the inch for embankments of 14 and 24 feet roadway, and for excavations of 18 and 28 feet, rulings 12 x 19 $\frac{3}{4}$ inches, per quire \$5.00	" 25
3577.	Cross Section Paper, in sheets 16 x 20 inches, 8 feet to the inch, per quire \$5.00	" 25
3578.	Cross Section Paper, in sheets, 16 x 20 inches, 10 feet to the inch, per quire \$5.00	" 25
3579.	Cross Section Paper, in sheets, 16 x 20 inches, 10 feet to the inch, every fifth line heavy, per quire \$5.00	" 25
3580.	Cross Section Paper, in sheets, 16 x 20 inches, 16 feet to the inch, per quire \$5.00	" 25

WEAVER'S DESIGN PAPER.

The Block is one Square Inch.

3581.	Weaver's Design Paper, 4 x 4 to block, per quire \$3 00	per sheet \$0 15
3582.	" " " 6 x 8 " " 3 00	" 15
3583.	" " " 8 x 8 " " 3 00	" 15
3584.	" " " 10 x 10 " " 3 00	" 15
3585.	" " " 12 x 12 " " 3 00	" 15
3586.	" " " 15 x 15 " " 3 00	" 15
3587.	Patent Office Blanks on Bristol Board, per dozen \$1 00	each 10

TRACING CLOTH AND PAPER.

3590.	Imperial Tracing Cloth in rolls of 24 yards, glazed on both sides or one side dull for penciling,		
	18 inches wide,	per roll \$4.50	per yard \$0 25
	30 "	" 6 90	" 40
	36 "	" 7 60	" 45
	42 "	" 10 50	" 60
3591.	Sagar's Patent Tracing Cloth.		
	18 inches wide	" 5 00	" 25
	30 "	" 7 40	" 40
	36 "	" 8 10	" 45
	42 "	" 11 00	" 60

STAR ★ ★ ★ BRAND. "VICTORINE."

MEDIUM COLD PRESSED DETAIL PAPER.

The Victorine Detail has a surface similar to the best White Drawing Paper. It acts well under the rubber; India Ink and Water Colors do not spread, and the cold pressed surface displays Pencil or Crayon to a better advantage than any smooth Detail Paper.

100 yd. roll, 48 in. wide, \$7 75	100 yd. roll, 40 in. wide, \$7 75
50 " " " 4 25	50 " " " 4 25
25 " " " 2 50	25 " " " 2 20

Also in rolls weighing 125 to 150 lbs. at 13 c. per pound. Sold by

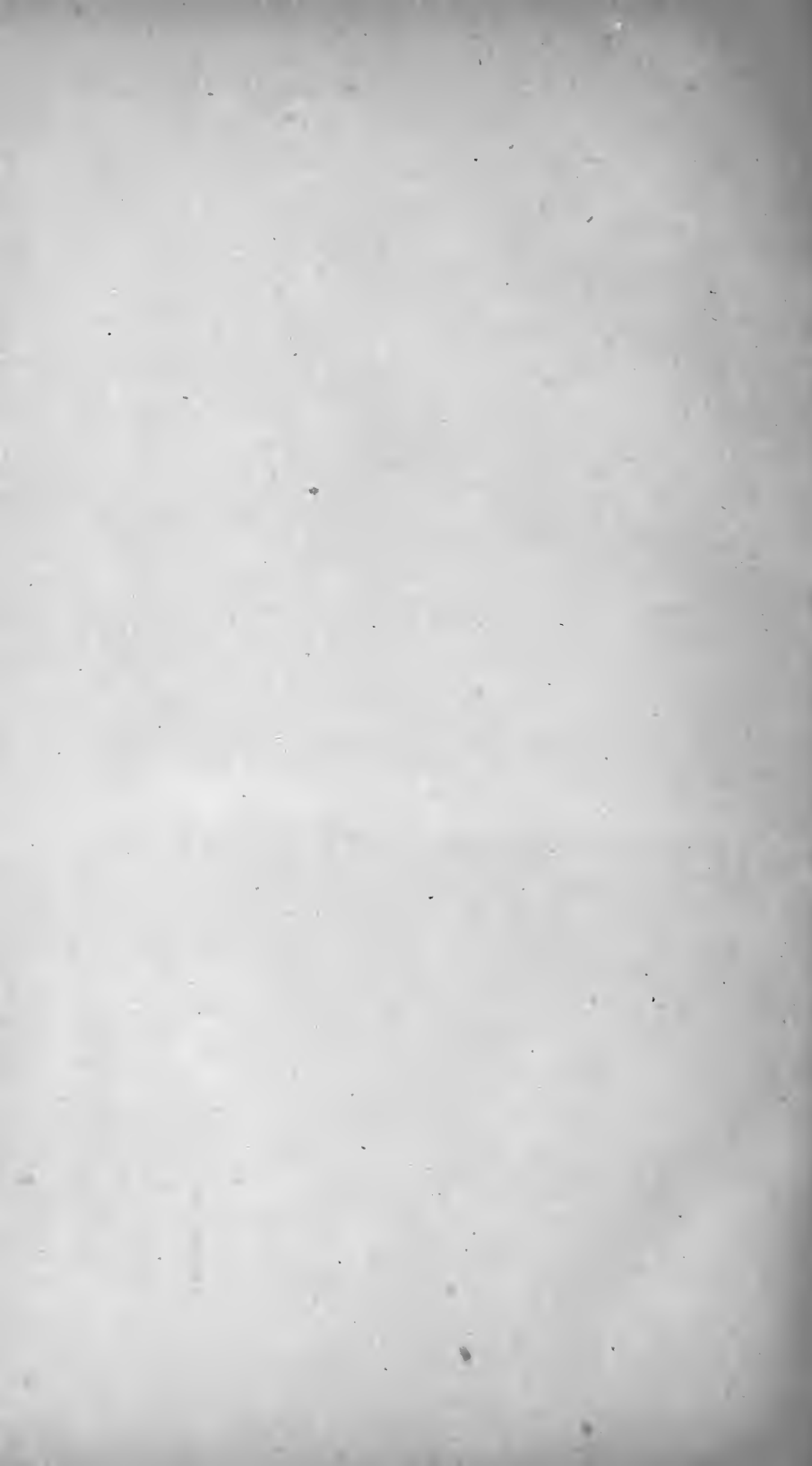
F. W. McALLISTER,

Importer, Wholesale and Retail Dealer in Mathematical Instruments, Drawing and Tracing Papers and Cloths,

No. 3 N. Charles St., Baltimore, Md.

TRY A SAMPLE ROLL.

TELEPHONE No. 1687.



PREPARED SENSITIVE PAPER,

FOR COPYING DRAWINGS :

To use the Sensitive Paper, first procure a printing frame, lay the drawing face down upon the glass, on which place the Sensitive Paper, prepared side down, then several thicknesses of cotton flannel for a pad ; if on turning the frame over any wrinkles appear open the hinged back and place a piece of paper in order to press them out (this should be done in a darkened room), then expose to the sunlight for five or ten minutes, depending on the clearness of the day, remove and examine in a dark room by opening the back of the frame, if the lines are slightly turned in color it has been done properly, remove it and wash in clear water with two or three changes, then dry it.

The paper must be kept in perfect *darkness* until used.

In Sheets.

3592.	16 x 21 inches, Special Photographic Paper . . .	per dozen	\$0 85
	20 x 23 " " " " . . .	"	1 25
	24 x 40 " " " " . . .	"	2 50
	27 x 40 " " " " . . .	"	3 50
	31 x 53 " " " " . . .	"	5 50
3593.	Sensitive Paper, in rolls of 50 yards, 40 inches wide . . .	per yard	40
3594.	White Ink for writing on Blue Prints . . .	2 oz. bottle	60
3595.	Red " " " " . . .	"	75
3596.	Paper in rolls of 50 yards for sensitizing, 42 inches wide, . . .	per roll	8 60
3597.	" " " " 54 " " . . .	"	10 50
3598.	Steinbach's, 53 inches wide, light . . .	per yard	35
3599.	" " " heavy . . .	"	50

TRACING PAPER, IN SHEETS.

3600.	French, Royal, 19 x 25 inches . . .	per quire	\$1 00
3601.	" Super Royal, 21 x 26 " . . .	"	1 50
3602.	" Double Elephant, 28 x 40 " . . .	"	2 50
3603.	" Vegetable Royal, 19 x 25 " . . .	"	2 20
3604.	" " Super Royal, 21 x 26 inches . . .	"	3 50
3605.	" " Double Elephant 28 x 40 " . . .	"	10 00
3606.	English, in sheets, 20 x 30 inches . . .	"	1 50
3607.	" " 30 x 40 " . . .	"	3 00
3608.	" " best quality, 20 x 30 inches . . .	"	2 50
3609.	" " 30 x 40 inches . . .	"	5 00

TRACING PAPER IN ROLLS.

3610.	English Tracing Paper, in rolls of 20 yards, 40 inches wide	per roll	\$4 00
3611	" " " Bluish Tint, 43 inches wide, 22 yards long . . .	"	2 50
3612.	French Tracing Paper, in rolls of 22 yards. Light . . .	"	2 50
3613.	" " " " 22 " Medium . . .	"	3 00
3614.	" " " " 22 " Heavy . . .	"	3 50
3615.	German Tracing Paper, in rolls of 44 yards, 54 inches wide	"	5 50
3616.	Parchment Tracing Paper, 37 inches wide, in rolls of 20 yds.	"	5 50
	Sample Books, Drawing Paper, Profile Paper, Tracing Paper and Cloth . . .	"	15

ENGINEERS'

3625.

3625. Level Book, 4 x 6 $\frac{1}{2}$ inches, of Extra Smooth Paper . per dozen \$4 50
 3626. " 4 x 7 inches, of Superior Drawing Paper " 6 00
 3627. " 4 $\frac{3}{4}$ x 7 $\frac{1}{2}$ " " " 7 50
 3628. Profile Level Book, one page Level ruling and the other
 Profile ruling, 4 $\frac{3}{4}$ x 7 $\frac{1}{2}$ inches, of Superior Paper . " 7 50

3629.

3629. Transit Book 4 x 6 $\frac{1}{2}$ inches, of Extra Smooth Paper . per dozen \$4 50
 3630. " 4 x 7 " of Superior Drawing Paper " 6 00
 3631. " 4 $\frac{3}{4}$ x 7 $\frac{1}{2}$ " " " " 7 50

3632.

3632. Record Book, 5 x 7 $\frac{1}{2}$ inches, of Extra Smooth Paper . per dozen \$9 00

3633.

3633. Cross Section Book, 7 x 8 inches, for Topography . per dozen \$12 00

3559—RETSILLA, 42 INCHES WIDE,
DETAIL PAPER FOR ARCHITECTS, DRAUGHTSMEN, &c.

Rolls, 10 yards.....75c.

“ 20 pounds, per pound, 13c.

“ 50 “ and upward 11c.

Sold by

F. W. McALLISTER,

Importer, Wholesale and Retail Dealer in Mathematical Instruments, Drawing
and Tracing Papers and Cloths,

No. 3 N. Charles St., Baltimore, Md.

TRY A SAMPLE ROLL.

TELEPHONE No. 1687.

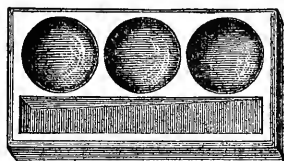


BOUND PROFILE BOOKS.

3635.	Plate A.	25 leaves, Imitation Morocco, elastic band, $5\frac{3}{4} \times 9\frac{1}{2}$ inches	each \$3 50
	Plate A.	50 leaves, Imitation Morocco, elastic band,, $5\frac{3}{4} \times 9\frac{1}{2}$ inches	" 5 00
	Plate A.	100 leaves, Imitation Morocco, elastic band, $5\frac{3}{4} \times 9\frac{1}{2}$ inches	" 8 00
	Plate A.	50 leaves, Turkey Morocco, turned edges, $5\frac{3}{4} \times 9\frac{1}{2}$ inches	" 8 00
	Plate A.	100 leaves, Turkey Morocco, turned edges, $5\frac{3}{4} \times 9\frac{1}{2}$ inches	" 9 00
3636.	Plate B.	25 leaves, Imitation Morocco, with elastic band, $5\frac{3}{4} \times 9\frac{1}{2}$ inches	" 3 50
	Plate B.	50 leaves, Imitation Morocco, with elastic band, $5\frac{3}{4} \times 9\frac{1}{2}$ inches	" 5 00
	Plate B.	100 leaves, Imitation Morocco, with elastic band, $5\frac{3}{4} \times 9\frac{1}{2}$ inches	" 8 00
	Plate B.	50 leaves, Turkey Morocco, turned edges, with elastic band, $5\frac{3}{4} \times 9\frac{1}{2}$ inches	" 6 00
	Plate B.	100 leaves, Turkey Morocco, turned edges, with elastic band, $5\frac{3}{4} \times 9\frac{1}{2}$ inches	" 9 00

Each page will contain a profile of 3000 feet in length.

Ink Slabs and Saucers.



3640.

3640.	Porcelain Slab, 1 slant and 3 wells, $1\frac{1}{2} \times 2\frac{3}{4}$ inches	each \$0 15
3641.	" " " $2\frac{3}{8} \times 3\frac{3}{4}$ "	" 25
3642.	" " " $2\frac{3}{4} \times 4\frac{3}{8}$ "	" 35
3643.	" divided 1 slant and 3 wells, $2\frac{3}{4} \times 4\frac{3}{8}$ inches	" 40
3644.	" 3 slants	" 25
3645.	" 6 "	" 50
3646.	" 12 "	" 90
3647.	" 12 " and wells ! ! ! ! !	" 1 25

STAR ★ ★ BRAND.

Parchment Paper.

Imported expressly by me. It is very transparent, tough and light weight.
USED INSTEAD OF TRACING CLOTH. THE ORIGINAL DRAWING
CAN BE MADE ON THIS PAPER so that BLUE PRINT COPIES can be
made without additional expense and trouble of Tracing.

In Rolls 11 yards, 37 in. wide, \$1 90
" 22 " " " 3 75

Sold by

F. W. McALLISTER,

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and Tracing Papers and Cloths,

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TELEPHONE No. 1687.

STAR ★ ★ BRAND.

Parchment Paper.

Imported expressly by me. It is very transparent, tough and light weight.
USED INSTEAD OF TRACING CLOTH. THE ORIGINAL DRAWING
CAN BE MADE ON THIS PAPER so that BLUE PRINT COPIES can be
made without additional expense and trouble of Tracing.

In Rolls 11 yards, 37 in. wide, \$1.90
" " " " " " 3.75
Sold by

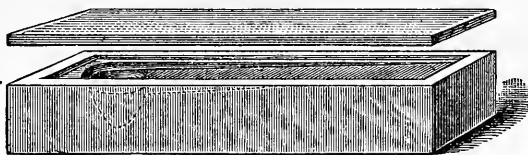
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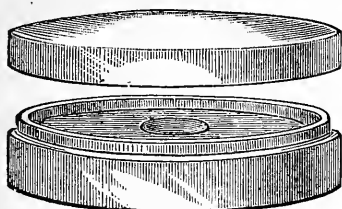
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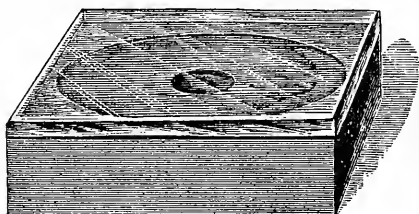


3649.

3649. Procelain Ink Slab, $1\frac{3}{4} \times 4\frac{1}{2}$ inches, rough surface, with cover each \$0 50
 3650. " " $2\frac{1}{8} \times 5\frac{1}{4}$ " " " " 60

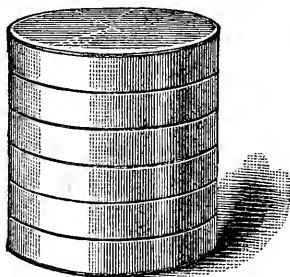


3651.



3652.

3651. Procelain Ink Slab, round, with cover, $3\frac{1}{2}$ inches diameter each \$0 50
 3652. Ink Slab of Slate, with rough surface, and glass cover " 50



3653.

3653. Cabinet Nests, 5 Porcelain Saucers, with cover, $2\frac{1}{2}$ inches diameter per nest \$0 60
 3654. Cabinet Nests, 5 Porcelain Saucers, with cover, $2\frac{3}{4}$ inches diameter " 70
 3655. Cabinet Nests, 5 Porcelain Saucers, with cover, 3 inches diameter " 80
 3656. Cabinet Nests, 5 Porcelain Saucers, with cover, $3\frac{3}{4}$ inches diameter " 1 00
 3657. Procelain Saucers, 1 inch diameter per dozen 20
 3658. " 2 " " 75
 3659. " 3 " " 1 35
 3660. Glass Sponge Cups, 3 inches diameter each 25

Winsor & Newton's Colors.



3670.

3670. In Cakes or Moist. Cakes or Pans, 25 cents each ; half Cakes or Pans, 15 cents each.

Antwerp Blue,	Gamboge,	Payne's Gray,
Bistre,	Hooker's Green, No. 1,	Prussian Blue,
Blue Black,	" " " 2,	Prussian Green,
British Ink,	Indigo,	Raw Sienna,
Brown Ochre,	Indian Red,	Raw Umber,
Brown Pink,	Italian Pink,	Red Lead,
Burnt Sienna,	Ivory Black,	Roman Ochre,
Burnt Umber,	King's Yellow,	Sap Green,
Chinese White,	Lamp-Black,	Terre Verte,
Chrome Yellow,	Light Red,	Vandyke Brown,
Deep Chrome,	Naples Yellow,	Venetian Red,
Dragon's Blood,	Neutral Tint,	Vermilion,
Emerald Green,	Olive Green,	Yellow Lake,
Flake White,	Orange Chrome,	Yellow Ochre.

3671. Whole Cakes, 45 cents each ; half Cakes, 25 cents each.

Black Lead,	Indian Yellow,	Reuben's Madder,
Brown Madder,	Mars Yellow,	Scarlet Lake,
Chalon's Brown,	Neutral Orange,	Scarlet Vermilion,
Constant White,	Purple Lake,	Sepia,
Crimson Lake,	Roman Sepia,	Warm Sepia.

3672. Whole Cakes, 60 cents each ; half Cakes, 30 cents each.

Cobalt Blue,	Orange Vermilion,	Violet Carmine.
--------------	-------------------	-----------------

3673. Whole Cakes, 90 cents each ; half Cakes, 45 cents each.

Aureolin,	Gallstone,	Pale Cadmium Yellow,
Burnt Carmine,	Green Oxide of Chro-	Pink Madder,
Cadmium Yellow,	mium,	Pure Scarlet,
Cadmium Orange,	Indian Purple,	Rose Madder,
Carmine,	Intense Blue,	Viridian.
French Blue,	Lemon Yellow,	

3674. Whole Cakes, \$1.50 each ; half Cakes, 75 cents each.

Purple Madder,	Field's Orange Ver-	Madder Carmine,
Smalt,	milion,	Mars' Orange,
	Ultramarine Ash.	

3675. Genuine Ultramarine, $\frac{1}{4}$ Cakes each \$2 00

STAR ★ ★ ★ BRAND. ORIOLE (light) TRACING PAPER.

This paper is in general use for TRACING DETAIL, takes INDIA INK and WATER COLORS. Does not break in folding and is reasonably strong.
In Rolls. 22 yards. 60 in. wide, 1.00 Sold by

F. W. McALLISTER,

Importer, Wholesale and Retail Dealer in Mathematical Instruments, Drawing and Tracing Papers and Cloths,

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TELEPHONE No. 1687.

India Ink.



STAR BRAND

ORIGINE (light) TRACING PAPER

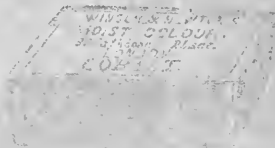
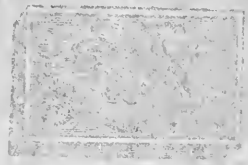
This paper is in general use for TRACING DETAILS, takes INDIA INK and WATER COLORS. Does not break in folding and is reasonably strong. In Rolls, 22 yards, 60 in wide, 100 in wide, 150 in wide, 200 in wide, 250 in wide, 300 in wide, 350 in wide, 400 in wide, 450 in wide, 500 in wide, 550 in wide, 600 in wide, 650 in wide, 700 in wide, 750 in wide, 800 in wide, 850 in wide, 900 in wide, 950 in wide, 1000 in wide.

F. W. McALLISTER

Importers, Wholesale and Retail, in Mechanical Instruments, Drawing and Tracing Papers and Colors, 101 N. Charles St., Baltimore, Md.

No. 8 N. Charles St., Baltimore, Md.
TELEPHONE No. 1887

TRY A SAMPLE ROLL



- | | | | |
|------|--|------------------------|-----------------|
| 3870 | In Cakes or Moist. | Cakes or Pastels. | |
| | 75 cents each. | | |
| | Antwerp Blue. | Gamboge. | Payson Blue. |
| | Bluish. | Hooker's Green, No. 1. | Prussian Blue. |
| | Blue Black. | " " " 2. | Prussian Green. |
| | British Ink. | Indigo. | Raw Sienna. |
| | Brown Ochre. | Indian Red. | Raw Umber. |
| | Brown Pink. | Italian Pink. | Red Lead. |
| | Burnt Sienna. | Ivory Black. | Roman Ochre. |
| | Burnt Umber. | King's Yellow. | Sep Green. |
| | Chinese White. | Lamp Black. | Terracotta. |
| | Chrome Yellow. | Light Red. | Vandyke Brown. |
| | Deep Chrome. | Ultramarine Yellow. | Vandyke Red. |
| | Dragon's Blood. | Neutral Tint. | Vandyke. |
| | Emerald Green. | Olive Green. | Vandyke. |
| | Flake White. | Orange Chrome. | Vandyke. |
| 3871 | Whole Cakes, 45 cents each; half Cakes, 25 cents each. | | |
| | Black Lead. | Indian Yellow. | Raw Umber. |
| | Brown Madder. | Italian Yellow. | Raw Umber. |
| | Chinese Brown. | Neutral Orange. | Raw Umber. |
| | Chinese White. | Purple Lake. | Raw Umber. |
| | Chinese Lake. | Roman Red. | Raw Umber. |
| 3872 | Whole Cakes, 60 cents each; half Cakes, 30 cents each. | | |
| | Cobalt Blue. | Orange Vermilion. | Vandyke. |
| 3873 | Whole Cakes, 45 cents each; half Cakes, 25 cents each. | | |
| | Chinese Lake. | Gallstone. | Vandyke. |
| | Burnt Sienna. | Green Ochre of Chrome. | Vandyke. |
| | Chinese Lake. | Indian Yellow. | Vandyke. |
| | Chinese Lake. | Indian Yellow. | Vandyke. |
| | Chinese Lake. | Indian Yellow. | Vandyke. |
| | Chinese Lake. | Indian Yellow. | Vandyke. |
| | Chinese Lake. | Indian Yellow. | Vandyke. |
| 3874 | Whole Cakes, 45 cents each; half Cakes, 25 cents each. | | |
| | Purple Madder. | Indian Yellow. | Vandyke. |
| | Chinese Lake. | Indian Yellow. | Vandyke. |
| 3875 | Whole Cakes, 45 cents each; half Cakes, 25 cents each. | | |
| | Purple Madder. | Indian Yellow. | Vandyke. |
| | Chinese Lake. | Indian Yellow. | Vandyke. |

Winsor & Newton's Liquid Inks and Colors.

3680.	Liquid Carmine	per bottle \$0	50
3681.	“ Gold Ink	“	55
3682.	“ India Ink	“	35
3683.	Rowney's Liquid India Ink	“	35
3684.	Liquid Chinese White	“	35
3685.	Higgins Liquid Drawing Ink	“	25

India Inks.

3690.	India Ink, in sticks, 2 inches long	each \$0	10
3691.	“ “ Round Lion's Head, 2½ inches long	“	25
3692.	“ “ “ “ 4 “	“	75



3693.



3696.



3697.

3693.	India Ink, in sticks, Oval Lion's Head, gilt, 3 inches long	each \$0 40
3694.	" " $\frac{1}{4} \times \frac{1}{2} \times 2\frac{5}{8}$, black, with gilt figures	" 40
3695.	" " $\frac{5}{16} \times \frac{5}{8} \times 2\frac{3}{4}$, gilt, with blue figures	" 50
3696.	" " Oblong, $\frac{1}{2} \times \frac{7}{8} \times 3\frac{3}{4}$ inches	" 1 50
3697.	" " $3\frac{1}{2}$ inches long, Winsor & Newton's, best	" 2 00
3698.	" " Sexagon, $\frac{3}{4} \times 4\frac{1}{2}$ inches	" 2 00
3699.	" best quality, $\frac{5}{16} \times \frac{5}{8} \times 2\frac{3}{4}$, stork figure, gilt	" 3 50



3700.

3700.	Chinese Ink, best quality, $\frac{1}{2} \times 1\frac{1}{2} \times 4\frac{3}{4}$, gilt figures	each \$6 00
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COLORED INKS IN STICKS.

3705.	India Blue (Ultramarine), in oblong sticks	each \$0 75
3706.	" Yellow (Chrome), " "	" 75
3707.	" Brown (Burnt Sienna) " "	" 75
3708.	" Red (Vermilion), " "	" 1 00
3709.	" Lake (Crimson), " "	" 1 25

“TRIPLEX,”

A Superior Detail Drawing Paper, manufactured solely for our trade, is tough, hard, uniform in grain and finish, stands erasing well and takes ink and water color perfectly. The cream color is very agreeable to the eye and permits handling without soiling.

Please compare this paper with others of a similar grade and color, also note the **Reduced Price.**

Sold in rolls 10 yards each, 36 inches	\$1 00
“ “ 10 “ 42 “	1 20
In rolls of 30 to 40 pounds at	22c

F. W. McALLISTER,

Importer, Wholesale and Retail Dealer in Mathematical Instruments, Drawing and Tracing Papers and Cloths,

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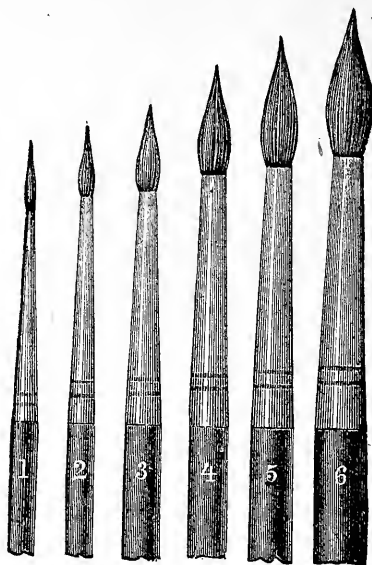
TRY A SAMPLE ROLL.

TELEPHONE No. 1687.



3751. Camel Hair, in Swan Quills.

Nos.	1	2	3	4	5	6	
	.50	.40	.30	.25	.20	.15	cents each.



3752. Camel Hair, in tin, with handle.

No.	1	2	3	4	5	6	
	.10	.10	.12	.12	.15	.15	cents each.



3753.

3753. Camel Hair Wash Brushes, single.

No.	0	1	2	3	
	.20	.30	.35	.40	cents each.



1.



2.



3.

3754.

3754. Camel Hair Wash Brushes, double.

Nos.	1	2	3	
	.50	.60	.75	cents each.

"L'ARCHITECTE," for General Draughting.

It is a white paper of pure tone, excellent fibre, superb erasing quality, with a surface that will be found well adapted to any kind of drawing.

Per Roll, 10 yards, 36 inches wide, \$1 80

" " " 42 " " 2 25

" " " 54 " " 3 00

In full Rolls, 50 lbs. and upward, 30 cents per pound. Sold by

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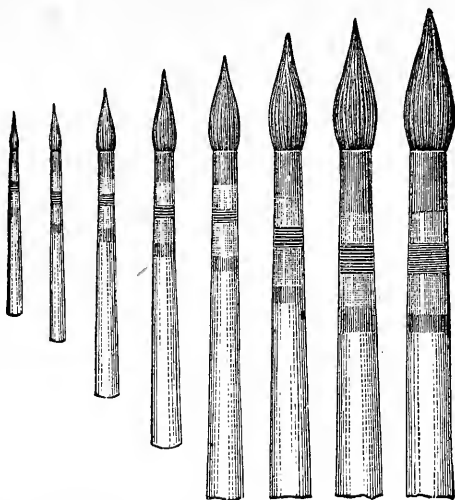
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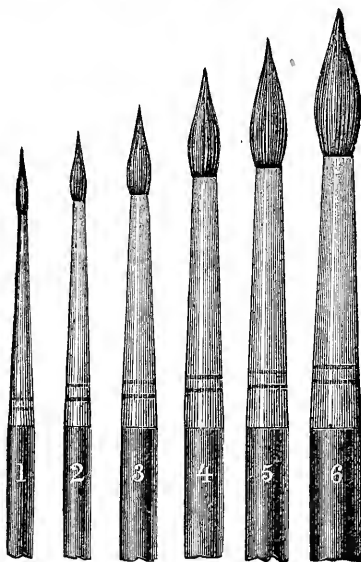
TELEPHONE No. 1687.



SABLE BRUSHES.



1. 2. 3. 4. 5. 6. 7. 8.
3755. Red Sable, in quills, tied with gold wire.
 No. 1 2 3 4 5 6 7 8
 .10 .12 .15 .18 .20 .25 .30 .35 cents each.
3756. Red Sable, in Swan Quills.
 No. 1 2 3 4 5 6
 \$1.75 \$1.50 \$1.25 \$1.00 .75 .60 cents each.

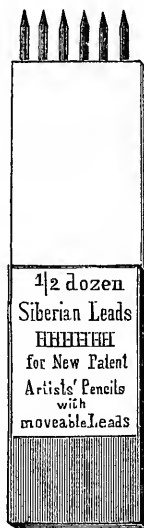


3757. Red Sable, in Tin, with handle.
 No. 1 2 3 4 5 6
 .20 .20 .25 .25 .30 .45 cents each.

Lead Pencils.



3760.



3766.

3760.	Faber's Lead Pencils, round black, Nos. 1, 2, 3 and 4 . . .	per doz.	\$0 60
3761.	" " hexagon gilt, Nos. 1, 2, 3, 4 and 5 . . .	"	75
3762.	" Siberian Lead Pencils, BBBB, BBBB, BBB, BB, B, HB, F, H, HH, HHH, HHHHHH, very superior, 15 cents each . . .	"	1 25
3763.	" Artist's Pencil, hexagon gilt for movable leads, Nos. 1, 2, 3, 4 and 5 . . .	each	25
3764.	Faber's Leads for Artist's Pencils, Nos. 1, 2, 3, 4 and 5 . . .	per box of six	50
3765.	" Siberian Pencil for movable leads, 3H to 6H . . .	each	35
3766.	" " Leads . . .	per box of six	75

These Leads will fit the German Instruments and the Patent Joint Instruments.

3767.	Short Leads, soft, $2\frac{1}{2}$ inches long . . .	per box	\$0 15
3768.	Faber's Pencils for Dividers . . .	per doz.	60
3769.	Union Pencils . . .	"	45
3770.	Red Chalk Pencils, in Cedar . . .	"	1 00
3771.	Black Chalk, round, in boxes . . .	per gross	2 50

DURABLE, SERVICEABLE AND NOT EXPENSIVE.

This paper is in general use for Tracing Detail, takes India Ink and Water Colors. Does not break in folding and is reasonably strong.

In rolls. 44 yds. 48 in. wide. List price \$2 00. Net Price \$1 70. Sold by

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and Tracing Papers and Cloths,

No. 3 N. Charles St., Baltimore, Md.

TRY A SAMPLE ROLL.

TELEPHONE No. 1687.

Compasses.

POCKET COMPASSES



TRY A SAMPLE ROLL.



Miscellaneous.



3775.

3775.	Rodger's Steel Erasers, 5 inches long, Cocoa Handle . . .	each \$0	50
3776.	" " 6 " " " " " " " " " " " "	"	65
3777.	" " 5 " Ivory Handle . . .	"	65
3778.	" " 5 " " " " " " " " " "	"	80
3779.	Gillott's Mapping Pens	per doz.	60
3780.	" Lithographic Crow Quills	"	60
3781.	David's Carmine, 2 oz. bottles, glass stopper . . .	per bottle	50
3782.	Blue Ink	"	25

Compasses.

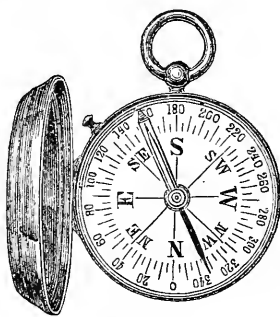
POCKET COMPASSES.



3800.

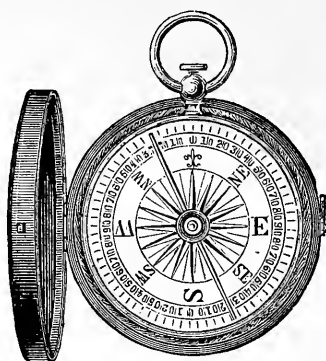


3301.



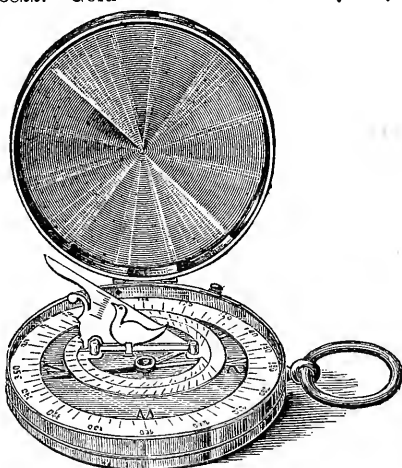
3804.

3800.	Brass, 1 inch diameter, no stop to needle and no cover . . .	each \$0	40
3801.	" 1 1/8 " " with " " " " " " " "	"	50
3802.	" 1 3/8 " " " " " " agate centre, no cover	"	1 00
3803.	Nickel Plated, 1 1/2 inches diameter, with stop to needle and agate centre, no cover	"	1 25
3804.	Brass, 1 1/2 inches diameter, with stop to needle, with agate centre and hinged cover, watch pattern	"	1 25
3805.	Same as No. 3804, Nickel-plated	"	2 00
3806.	Mahogany, 2 inches square, with stop to needle	"	1 25
3807.	Same as No. 3806, with agate centre to needle	"	2 00
3808.	Fine English Gilt Porcelain Dial, agate centre and stop, bar, needle, in morocco case, 1 1/2 inches diameter	"	6 00

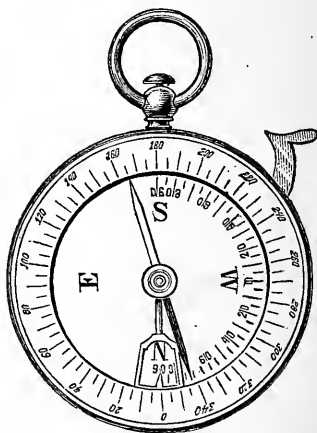


3809.

3809.	Same as No. 3808,	$1\frac{3}{8}$ inches diameter	each	\$6 75
3810.	" "	$1\frac{3}{4}$ "	"	7 50
3811.	Gilt Charm Compasses,	$\frac{1}{2}$ inch diameter	"	25
3812.	" "	without rings, for mounting in lockets, &c., common	"	20
3813.	Gilt Charm Compasses, without rings, for mounting in lockets, &c., best quality, gilt and silver dial,	$\frac{3}{8}$ of an inch diameter	"	50
3814.	Same as No. 3813,	$\frac{1}{2}$ of an inch diameter	"	60
3815.	" "	$\frac{9}{16}$ "	"	65
3816.	" "	$\frac{5}{8}$ "	"	75
3817.	" "	$\frac{15}{16}$ "	"	1 00
3818.	Silver Charm Compasses,	$\frac{5}{8}$ inch diameter	"	90
3819.	" "	1 "	"	1 50
3820.	" "	$1\frac{3}{8}$ "	in form of steering wheel	4 00
3821.	Gold-plated Compasses		from	\$1 50 to 4 00
3822.	Gold		each	6 00

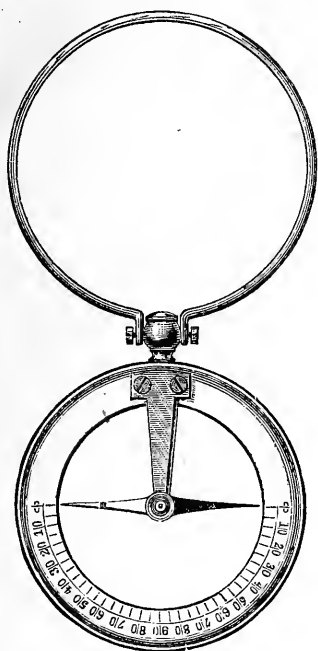


3824.

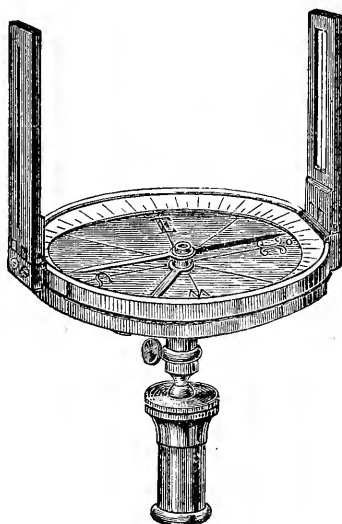


3826.

3823. Brass Sun-dial Compasses, with hinge cover, 2 inches diameter each \$3 50
 3824. Brass Sun-dial Compasses, with hinge cover, 2½ inches diameter " 4 50
 3825. Mahogany Sun-dial Compasses, in case " 8 00
 3826. Brass Geological Compasses, with pendulum for measuring the angle of inclination, 2½ inches diameter, and stop to needle " 4 00
 3827. Same as No. 3826, Nickel-plated " 4 50
 3828. Prismatic Azimuth Compass, Brass, 2¾ inches diameter " 18 00
 3829. " " 4 " " 22 00



3830.

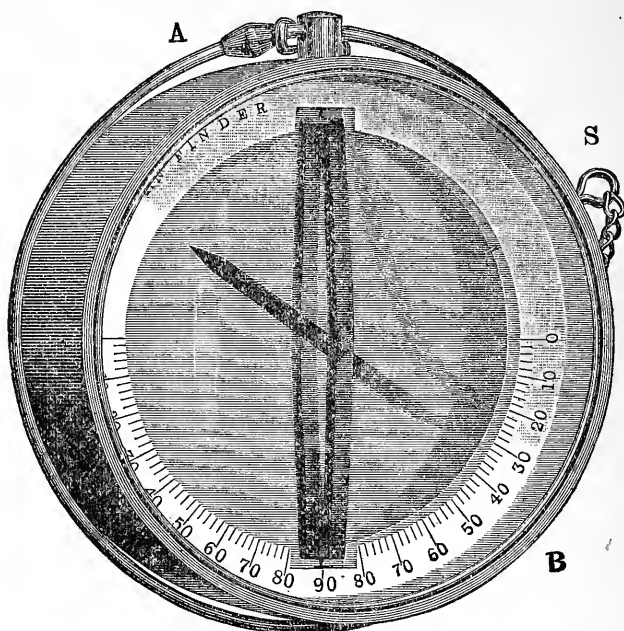


3836.

3830. Miners' Compass, for tracing iron ore. This consists of a dipping needle 2½ inches long, mounted in a brass ring graduated from 0° to 180° in each direction, and having plate glass top and bottom. When used for tracing ore, the prospector should hold the ring in his hand and keep the needle north and south, standing with his face to the west " " " " each \$12 00
 3831. Meridian Finder or Miners' Compass, 3½ inches in diameter. The advantage of this Compass is that the needle has a motion in Azimuth as well as in Altitude, thus insuring the needle finding its true Meridian. Also that the needle is suspended in such a way that it turns easily, with nothing to impede its revolution, by this means you have perfect test in reversing the needle. Another advantage is that the

needle is, and can be made more sensitive than other needles
of this kind each \$12 00

SURVEYORS' POCKET COMPASSES.



3831.

- | | | |
|-------|--|--------------|
| 3835. | Brass Pocket Compass, with folding sights, Jacob-staff mountings, needle $2\frac{1}{2}$ inches long, in case | each \$10 00 |
| 3836. | Brass Pocket Compass, with folding sights, Jacob-staff mountings, needle $3\frac{1}{2}$ inches long, in case | " 12 00 |
| 3837. | Brass Pocket Compass, with folding sights, Jacob-staff mountings, needle $3\frac{1}{2}$ inches long, and two straight levels | " 13 50 |
| 3838. | Brass Pocket Compass, with folding sights, Jacob-staff mountings, two straight levels, nonius and needle $3\frac{1}{2}$ inches long, in case | " 16 00 |

SURVEYORS' COMPASSES.

- | | | |
|-------|--|--------------|
| 3840. | Surveyors' Compass, 4 inch needle, two straight levels, Jacob-staff mountings, brass cover, outkeeper and sights graduated for taking angles of elevation and depression | each \$30 00 |
| 3841. | Surveyors' Compass, 5 inch needle, two straight levels, Jacob-staff mountings, brass cover, outkeeper and sights graduated for taking angles of elevation and depression | " \$35 00 |

EMPEROR.

Cold Pressed, Unglazed, Unprepared.

Emperor Cold Pressed, Unprepared Tracing Paper has a slightly rough surface; contains no oil; will not change color or become brittle with age, and is not injured in folding. India Ink and Water Colors do not spread or soak through. It is the best, cheapest and a most desirable Tracing Paper.

In Rolls. 22 yards, 45 inches, \$2 00. Subject to a discount. Sold by

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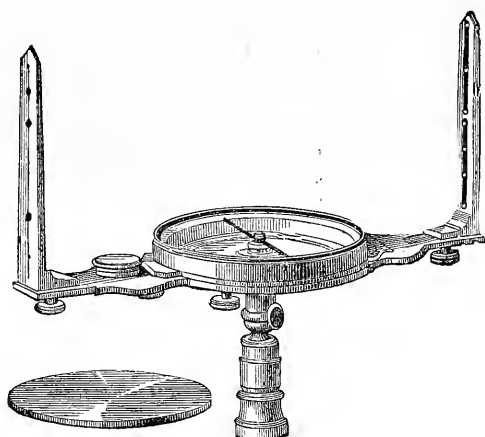
EMPEROR

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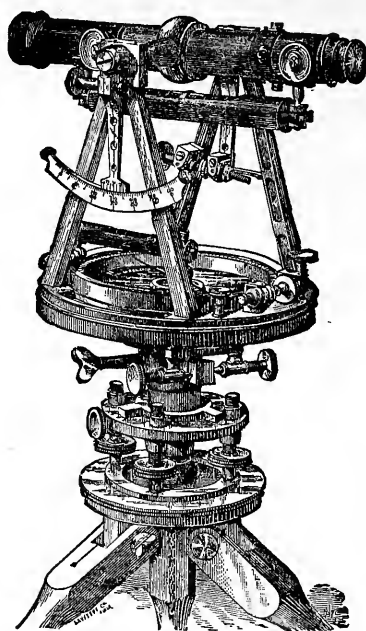
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3840

3842. Surveyors' Compass, 6 inch needle, two straight levels, Jacob-staff mountings, brass cover, outkeeper and sights graduated for taking angles of elevation and depression . . . each \$40 00
3843. Surveyors' Compass, 4 inch needle, two straight levels, Jacob-staff mountings, brass cover, outkeeper, vernier under the glass for adding or subtracting the magnetic variation of the needle, and sights graduated for taking angles of elevation or depression " 35 00
3844. Surveyors' Compass, 5 inch needle, two straight levels, Jacob-staff mountings, brass cover, outkeeper, vernier under the glass for adding or subtracting the magnetic variation of the needle, and sights graduated for taking angles of elevation and depression " 45 00
3845. Surveyors' Compass, 6 inch needle, two straight levels, Jacob-staff mountings, brass cover, outkeeper, vernier under the glass for adding or subtracting the magnetic variation of the needle, and sights graduated for taking angles of elevation and depression " 55 00

Engineers' Transits and Levels.



3850.

- 3850.** Complete Combined Transit and Leveling Instrument for Civil Engineers and Surveyors, 5 inch magnetic needle; long compound centres to plates. All graduations are on silver plate. The degrees of the ring and horizontal plate numbered in two rows, one from 0° to 90° each way, and the other row continuous, for repeating an angle from 0° to 360° . Double opposite verniers to horizontal limb; all level bulbs of ground glass; long sensitive level bubble; vertical arc, clamps and tangent screw movement to axis of telescope; tangent screw motions both to the horizontal limb and vernier plate; clamps on telescope axis, arranged with sighting slits and index marks for right-angle sighting (for offsets); telescope achromatic and erecting of extra high power and range (magnifies 28 diameters), and will read time on any ordinary watch dial, at a distance of 983 feet; telescope balanced in its axis, reversing both at eye and

STAR ★ BRAND. PARCHMENT PAPER.

Imported expressly for me. Is one of the best papers used for tracing ; being very transparent and tough, and IS USED INSTEAD OF TRACING CLOTH. THE ORIGINAL DRAWING CAN BE MADE ON THIS PAPER so that BLUE PRINT COPIES can be made without the additional expense.

In Rolls. 11 yards. 36 in. wide. \$1 90
" 22 " " 3 75

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In Rolls. 11 yards. 36 in. wide. \$1.90
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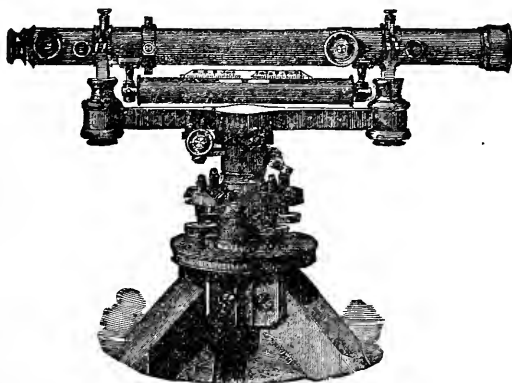
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object ends ; and with one end of its axis adjustable ; slide for closing aperture in cap, when not in use ; shifting *tripod* head to tripod, for precisely centering the instrument over a point, after approximately centering with tripod legs ; extra wide openings in vernier plate for reading the horizontal limb ; tripod head with the leveling screws, etc., detachable both from the instrument and from tripod legs, for packing in the box ; length of telescope $10\frac{3}{4}$ inches, diameter of the object-glass $1\frac{3}{4}$ inches price \$220 00

This instrument is securely packed in a mahogany box with leather straps, hooks, lock and key. India rubber washers in the box to prevent jarring in transportation ; a lens for reading verniers, camel-hair brush, sunshade for telescope, 2 screw-drivers and plummet.

3851. Plain Transit—similar to the above in every respect, except that it has no level, vertical arc, clamps or tangent screw motions to the axis of the telescope each \$185 00
3852. Small Mining and Reconnoissance Transit, with level, vertical arc, etc., similar to the Combined Transit excepting in size and weight “ 198 00
A full description of this excellent instrument will be sent when desired.
3853. Tunnel Transit, with 17 inch telescope, long compound centres, 5 inch needle, double opposite verniers to horizontal limb “ 298 00
3854. Lyman's Solar Transit. This is our complete combined transit and level instrument, with the addition of variation plate, stadia hairs, and the solar apparatus underneath the main plates ; all the graduations on silver plate. Price, securely packed “ 300 00



3855.

3855. Engineers' Y-Level. with long centre, telescope, bar and centres arranged in such a manner, as to detach above the leveling screws, without the possibility of jarring the instrument or its adjustments; tripod head with leveling screws detachable from the tripod legs, for packing in the box; telescope 17 inches long, erecting, achromatic and extra powerful; index arrangement on telescope and Y's for setting vertical hairs truly vertical. Packed in a mahogany box with sunshade, adjusting pins, etc.
Price each \$145 00
3856. Small Mining and Reconnoissance Level is a companion to No. 3852, and a fac-simile of our Engineers' Y-Level in every respect except size and weight; telescope $10\frac{3}{4}$ inches, object-glass 1 inch in diameter; magnifying power 28 diameters, and will read leveling rod without target at a distance of 700 feet; it weighs $2\frac{1}{2}$ pounds without the tripod; the tripod head of the Reconnoissance Transit will exactly fit this instrument. Packed in a box with strap to carry it on the shoulder like a field-glass. Price without tripod " 105 00
With tripod " 115 00
3857. Plain Transit. Needle, $4\frac{1}{2}$ inches long. Outside Verniers to plates, reading to one minute. Vertical adjustment to Telescope. Tangent to plates. Graduations $6\frac{1}{4}$ inches. Telescope giving a power of 20 diameters. Weight of the Instrument, plain, 19 pounds " 155 00
3858. Plain Transit. Needle 5 inches long. Two Verniers reading to minutes. Tangent to plates. Two straight Levels. Shifting Tripod. Improved Eye Piece. Slide Protector and Tangent. Telescope giving a power of 20 diameters. Graduations $4\frac{3}{4}$ inches. Weight of Instrument, plain, $17\frac{1}{2}$ pounds " 160 00
3859. Plain Transit. Needle $4\frac{1}{2}$ inches long. Long Centre. Two outside verniers, reading to minutes. Tangent to plates. Vertical adjustment to Telescope. Improved attachment to Tripod. Improved Eye Piece. Slide Protector and Tangent. Telescope having a power of 20 diameters. Weight of Instrument, $19\frac{1}{2}$ pounds " 190 00
3860. Level to Telescope, with Tangent, to any of the above Instruments " 25 00
3861. Vertical Arc to Telescope of any of the above " 15 00
3862. Graduations to read to 20 or 30 seconds " 10 00
3863. Stadia Hairs fixed " 3 00

AURORA Blue Print Paper.

(NOT PREPARED,)

An excellent paper for Blue Print Process; it is uniform in thickness and weight. Those preferring a smooth surface paper will find this the best in use.

	27 in.	30 in.	36 in.	42 in.	54 in.
In Rolls 50 yards,	\$5 50	6 00	6 50	8 50	10 50
“ 10 “	1 35	1 50	1 85	2 25	2 65
Full Rolls subject to a discount.			Sold by		

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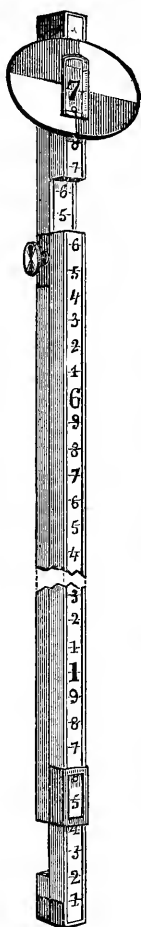
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3870.



FRONT VIEW.

3871.



SIDE VIEW.



3872.

- | | | |
|-------|--|--------------|
| 3870. | Philadelphia Leveling Rod, Self Reading, made of well seasoned Mahogany | each \$18 00 |
| 3871. | New York Leveling Rod | 16 00 |
| 3872. | Boston " " | 16 00 |
| 3873. | Mining Rod. This Rod is made of Mahogany, sliding from 3 feet to 6 feet, with the graduations on stout tape $1\frac{3}{4}$ inches wide, which is wound by a Spring, which thus gives you the correct reading | 25 00 |
| 3874. | English Leveling Rod, Mahogany, sliding from 5 feet to 14 feet, divided to feet and tenths | 25 00 |

"DETALIA."

"Detalia" is a new article for Drawing purposes. Slightly buff, is less trying to the eyes than ordinary colors. It is very tough, and even in finish, will bear rubbing and is unsurpassed for erasing; it may be erased and drawn upon and again erased without any important deterioration of the surface. It is the best paper in the market to-day for Engineer, Surveyor or Architect use.

36 inches,	10 yards,	per roll,	75
42 "	10 "		\$1 00
48 "	10 "		1 25
54 "	10 "		1 50

30 to 50 lb. Rolls, 15c. per lb. Sold by

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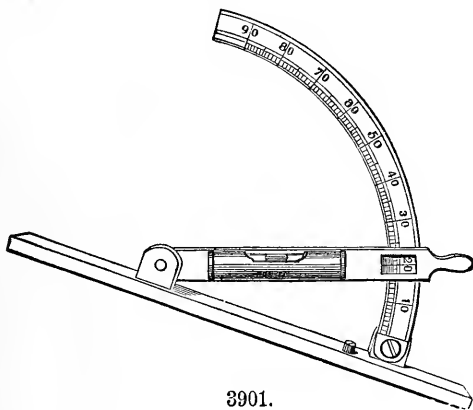


3875.	Ranging Poles, painted red and white alternately, made of well seasoned wood, 6 feet long	each \$2 50
3876.	Ranging Poles, 8 feet long	" 2 75
3877.	" 10 "	" 3 00
3878.	Metal Aligning Pole, 7 feet long	" 6 25

These are made of heavy metal tubing, $\frac{1}{8}$ of an inch outer diameter; painted red and white alternately, with Brass Shoe and Steel Point on one end, and on the opposite end a drill for transferring centres into stone, etc.; it weighs about the same as an 8 foot Ranging Pole. These tubes are weighed below, and also provided with a gimbal arrangement; this gimbal arrangement always keeps the rod precisely vertical.

3880.	Jacob-staff, made of seasoned Ash with Iron Shoe, steel pointed each	\$ 2 50
3881.	Light Compass, Tripod, made of seasoned Mahogany	" 8 00
3882.	Transit Tripod, with jointed legs for Mining Engineering from	\$12 00 to 25 00
3883.	Transit Tripod, with Leveling Screws and Head	each 25 00
3884.	Level to Telescope, with Tangent	" 25 00
3885.	Telescope, with Level either permanent or detachable, to attach to a Surveyors' Compass	" 35 00
3886.	Telescope, with the Level, to attach to our Surveyors' Compasses	" 25 00
3887.	Ball and Socket, without Tangent Screw	" 6 00
3888.	" " with "	" 15 00
3889.	Vernier plate to any of our Surveyors' Compasses	" 10 00
3890.	Vertical Arc to Telescope	" 15 00

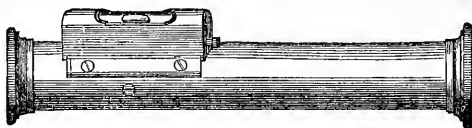
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3900.	Clynometer or Slope Level, for Miners, in box	each \$ 8 00
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3902. Clynometer or Slope Level, in square frame, in box . . . each \$12 00



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3903. Locke's Hand Level, Brass, in morocco case . . . each \$10 00
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 3934. " " 8 " 4 " 100 " " . . . " 4 50
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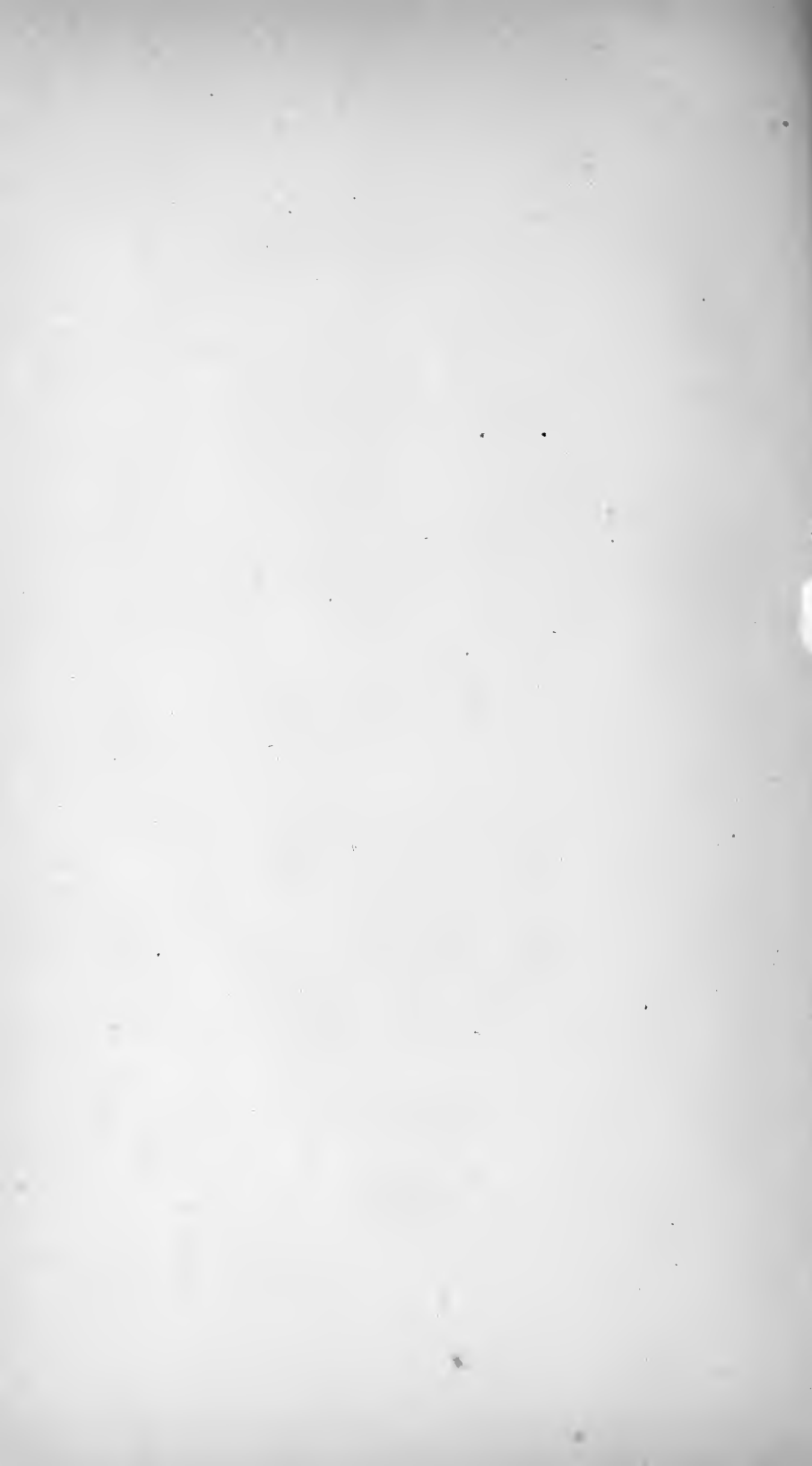
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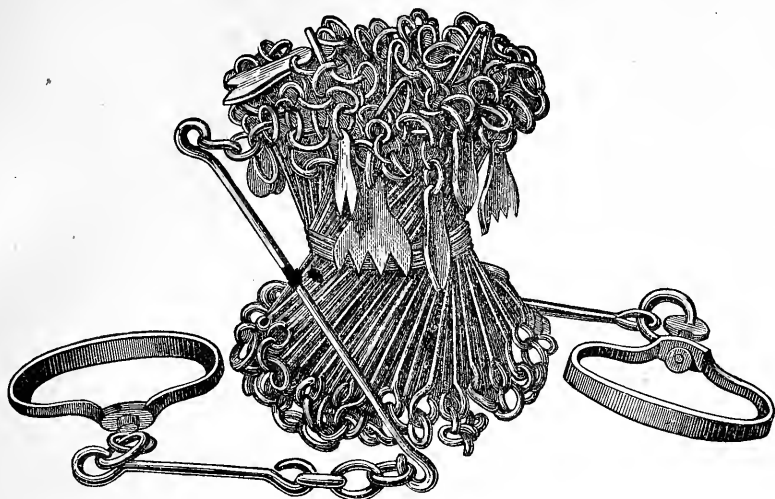
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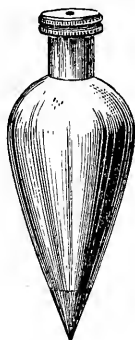
3936.	Iron Chain, No. 6 wire, 4 Poles, 100 Links, oval rings	each	\$6 50
3937.	Steel " " 12 " 2 " 50 " brazed rings and links	"	5 50
3938.	Steel Chain, No. 12 wire, 4 Poles, 50 Links, brazed rings and links	"	10 00
3939.	Iron Chain, No. 6 wire, 50 feet, 50 links	"	5 00
3940.	" " " 7 " 50 " 50 "	"	4 00
3941.	" " " 7 " 100 " 100 "	"	6 00
3942.	Steel " " 12 " 50 " 50 "	"	4 00
3943.	" " " 12 " 100 " 100 "	"	7 50
3944.	" " " 12 " 50 " 50 " brazed links and rings	"	6 00
3945.	" " " 12 " 100 " 100 " " "	"	11 50
3946.	Grumman's Patent Chain, 50 feet, No. 18, finely tempered steel wire, without rings, 100 Links, Spring Balance, Level and Thermometer for very accurate measurement, weight $\frac{3}{4}$ of a pound	"	15 00

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ELEVEN IN A SET.

3950.	Iron Arrows or Marking Pins, No. 7 wire, 15 inches long	per set	\$0 75
3951.	Steel " " " 8 " 15 " "	"	1 00
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3953.	" " " " tempered Steel, 15 inches long, $\frac{3}{4}$ inches wide	"	7 50

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3961.

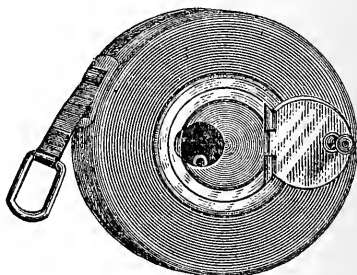
3960.	Iron Plumbob	each \$0 30
3961.	Brass Plumbob, Steel Pointed	" 2 50
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3963.	Adjustable Plumbob (Patented), 8 oz.	" 1 75
3964.	" " 13 oz.	" 2 25
3965.	Plumbob Cord	per yard 06

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Chesterman's Metallic Tapes, made of linen thread interwoven with brass wire, not so liable to stretch as those made entirely of linen, and better calculated to withstand the effects of moisture.



3975.



3985.

3975.	Metallic Tape, 24 feet long, divided in inches or tenths of a foot, in leather case, with folding handle	each \$1 80
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3976.	Metallic Tape, 33 feet long, divided in inches or tenths of a foot, in leather case, with folding handle	each \$2 10
3977.	Metallic Tape, 50 feet long, divided in inches or tenths of a foot, in leather case, with folding handle	" 2 60
3978.	Metallic Tape, 50 feet long, divided in inches or tenths of a foot, in leather case, with flush handle	" 3 25
3979.	Metallic Tape, 66 feet long, divided in inches or tenths of a foot, in leather case, with folding handle	" 3 00
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3983.	Chesterman's Metallic Tapes <i>only</i> .	
	33 50 66 100 feet.	
	\$1.50 \$1.75 \$2.00 \$3.25 each.	

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3987.	Steel Tape Measures, 50 feet long, leather case, flush handle, in tenths or twelfths	" 7 25
3988.	Steel Tape Measures, 66 feet long, leather case, flush handle, in tenths or twelfths	" 9 00
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3998.	Steel Tape Measures, in German Silver Case, with Spring Stop, 6 feet long, divided in either tenths or twelfths of a foot and millimetres	" 2 50

3999. Steel Tape Measures, in German Silver Case, with Spring Stop,
10 feet long, divided in inches each \$3 25
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10 feet long, divided in either tenths or twelfths of a foot
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4004. Steel Band Tape, $\frac{5}{8}$ inch wide, divided in feet and links, 50 feet
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4025. One foot, 4 fold, boxwood, brass joints each \$0 20
4026. " " " " and bound " 75
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4030. " " " " with Architects' Scales " 1 00
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all the parts of which in their separate application are per-
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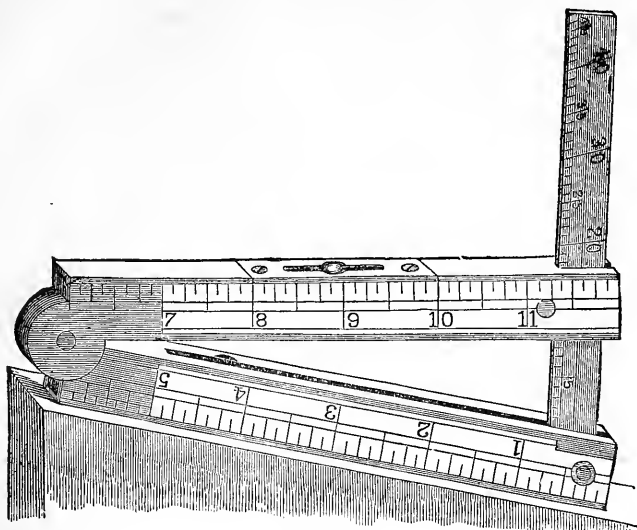
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4050.

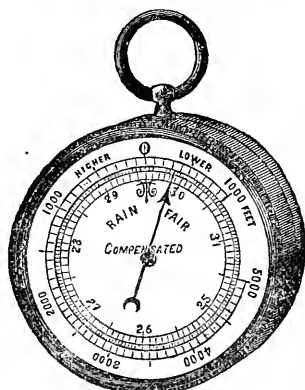
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4084.	" " 2 " " 1 " . . .	" 1 00
4085.	" " 3 " " $\frac{3}{4}$ " . . .	" 1 25
4086.	" " 3 " " 1 " . . .	" 1 50
4087.	Horn Case, German Silver Frame, 1 Lens, Bellows, $\frac{3}{4}$ inch diameter . . .	" 75
4088.	Same as No. 4087, 2 Lens . . .	" 1 50
4089.	" " 3 " . . .	" 2 00

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ANEROID BAROMETERS.

4100.	Aneroid Barometer, Brass Case, $2\frac{1}{2}$ inches in diameter . . .	each \$ 2 50
4101.	" Nickel-plated Case, $2\frac{1}{2}$ inches in diameter " . . .	3 50
4102.	" Brass Case, Silvered dial, 5 inches in diameter . . .	" 12 00
4103.	Aneroid Barometer, Brass Case, Silvered dial, open face, 5 inches in diameter . . .	" 13 00
4104.	Pocket Aneroid Barometer, German Silver Case, open face, $1\frac{3}{4}$ inches in diameter, registering to 9000 feet . . .	" 20 00
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4108.

4108.	Pocket Aneroid Barometer, Brass Case, $2\frac{1}{8}$ inches in diameter, Compensated, registering to 5000 feet . . .	each \$15 00
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4111. Pocket Aneroid Barometer, Brass Case, 3 inches in diameter, Compensated, Silvered dial, registering to 3000 feet . . . " 25 00
4112. Pocket Aneroid Barometer, Brass Case, 3 inches in diameter, Compensated, Silvered dial, registering to 5000 feet . . . " 25 00
4113. Aneroid Barometer, Brass Case, 5 inches in diameter, Silvered dial. U. S. Signal Service. Registering to 15,000 feet . . . " 40 00



4126.



4127.

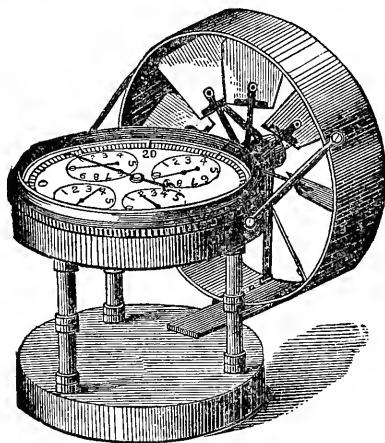


4128.

4125. Mercurial Barometer, Plain Walnut Case, 40 inches long, with Thermometer each \$ 8 00
4126. Mercurial Barometer, Plain Ash, round, with Thermometer " 10 00
4127. Mercurial Barometer, Polished Walnut Case, 36 inches long, with Hygrometer " 18 00
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